

Case Studies

Infrastructure in East Asia and the Pacific – The Way Forward

For the World Bank

by

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Case Study One (CS1): The Philippines

In the ten years to 2003 the Philippines has grown its landline capacity from 1 million to over 7 million, a notable achievement marred by the fact that demand is only 3.3 million. This massive over-investment has left the dominant incumbent Philippines Long Distance Telephone Company (PLDT) with just under one-third of the nation's telephone exchange capacity but nearly two-thirds of subscribers.

Before the opening of the market under the Service Areas Scheme (SAS) in 1993 over 80 per cent of telephone lines were in Metro Manila, the National Capital District (NCD). This figure is now down to around 40 per cent.

Table CS1.1
Estimated Telephone Lines and Subscribers (2002)
Mobile Cellular Subscribers (2003)

Company	Telephone Landlines	Telephone Subscribers	Landline Take-up Rate	Mobile Cellular Subscribers
PLDT	2,033,145	2,092,539	71%	
Smart (PLDT)				10,080,112
Piltel ¹ (PLDT)	473,341	76,716	16%	2,867,085
Globe/Innove ²	1,484,269	208,294	14%	8,800,000
Digitel	618,271	389,967	63%	732,467
Extelcom ¹				29,896
BayanTel	488,674	185,506	38%	
PT&T	189,169	38,573	20%	
EPTI	89,386	21,242	24%	
Philcom	219,343	49,596	23%	
PAPTELCO ³	418,627	248,500	59%	
Total	6,914,235	3,310,933	48%	22,509,560

Notes: 1 – analogue cellular. Extelcom is owned by BayanTel; 2 – previously Islacom; 3 – Philippine Association of Private Telephone Companies; Source: OPTEL and NTC.

According to the regulator the National Telecommunications Commission (NTC), in 2003 demand for mobile cellular phones rose 7 million from 15.4 million in 2002. While fixed line teledensity, the number of telephone lines per 100 population, stands around 4 nationally on a par with Indonesia – mobile cellphone networks cover over 90 per cent of the population (but less than 75 per cent of the country geographically) and mobile density is close to 30 per cent – nearly four times that of Indonesia.¹ Industry experts anticipate densities of 35%-40%, which raises the question where does the commercial frontier end and to what extent is mobile cellular answering the challenge of universal access?

¹ Indonesia has an estimated purchasing power parity per capita income of US\$3,100, Philippines US\$4,600.

Wireless Mobile Cellular

Two companies, both operating GSM systems, Smart (PLDT) and Globe dominate the wireless mobile cellular sector with 84 per cent of the market between them. The only significant challenger is Digitel, a company franchised to build landlines in a region of the Philippines untouched by PLDT and a late-comer to the mobile cellular market with the third GSM network. Digitel's brand, named Sun, is currently competing aggressively on price with Smart and Globe to gain market share. The following table compares the ranges of cellular and fixed line tariffs. Typically, pre-paid minutes of usage are more expensive than post-paid minutes of usage. For example, for US\$59 per month a post-paid user is entitled to 750 free minutes of usage, equivalent to 7 US cents per minute compared with a minimum charge of 14 cents per minute pre-paid.

Table CS1.2
Fixed and Cellular Tariff Ranges Compared (in US dollars and cents)

Fixed line monthly rental	Cellular post-paid monthly rental	Cellular post-paid free airtime	Cellular post-paid cost per minute	Cellular pre-paid cost per minute	Cellular SMS
\$5.50 - \$11.50	\$8.5 - \$59	20 - 750 mins.	8 - 19 cents	14 - 19 cents	\$1.7

Note: no fixed line local call charges

Extelcom and Piltel (PLDT) both run old analogue networks, and Piltel looks set to be absorbed by Smart.² The Philippines cellular market conforms to a widely held view expressed by strategic and financial investors alike who were interviewed for this survey that three is the optimum number of competitors in the mobile wireless space, where the top two make good profits and the third latecomer struggles to breakeven.

Wireless services added 38 per cent to the PLDT's consolidated net operating income of 21 billion peso (US\$14.7 billion), contributing 34 billion peso (US\$24 billion) to the accounts in 2002, compared with 46 billion peso (US\$32 billion) from all landline services, domestic and international. In the case of Globe, in 1Q 2004 wireless services added 84 per cent of the consolidated net operating income of 14 billion peso. These figures, and over capacity in landlines, explain why PLDT's capex for 1Q 2004 is only 800 million peso compared with Smart's 3.5 billion peso. They also explain why Globe's wireless services capitalized expenditures for 1Q 2004 are 4.3 billion peso (up from 1.8 billion 1Q 2003) compared with 150 million peso (down from 1.8 billion peso 1Q 2003) for its wireline services. No operator in the Philippines it seems is currently investing in new landlines other than high-speed data and broadband lines, of which there are estimated to be no more than 15 - 20,000, mainly to corporate customers in the business districts of major cities.³

² Piltel and Extelcom were awarded their mobile licences in 1989, Digitel, Globe and Smart in 1993.

³ Eastern Telecom (ETPI) is the leading carrier focused on the corporate market. ETPI was the major international carrier until the PLDT was awarded a virtual monopoly in the 1970s. Today over half the international call centre circuits from the Philippines are supplied by ETPI and payment comes in US dollars.

Pre-Paid

What has happened in the Philippines is more than just a rush for cellphones. The cellular phone market has the hallmarks of monopoly competition, in which the product is a commodity difficult to distinguish from its rivals, and competition must focus on market segmentation and corresponding price differentiation along with branding and competitive service innovation. The mass-market breakthrough has been the introduction of the pre-paid service. Pre-paid limits bad debt, previously a major problem in the Philippines, and operators benefit from instant cashflow, although the downside is high customer churn rates and higher customer acquisition costs.⁴

However the really important point is that pre-paid opens up previously unrevealed sources of demand among lower income groups. Pre-paid in the Philippines can be as low as 25 peso a SIM card, allowing users to easily monitor their calling expenditures, and the system is calling party pays (CPP) so there is no reluctance to accept calls. Further innovations include online top-ups for as little as 1 peso, Smart's Pasa-Load and Globe's Share-a-Load which allow users to transfer value to other people's SIM card accounts, and a service offering pre-registered receiving party pays (RPP) enabling callers who have run out of value to make calls. By the beginning of 2004 pre-paid accounted for ninety-three per cent of Globe's subscribers and 97.5% of Smart's subscribers.

SMS

Another Philippines phenomenon is SMS or short message services. Text messaging, domestic and international, contributed 34 per cent of Smart's operating revenues for the year ended 31 March 2003 (93 per cent of 'data' revenues). Both cost and convenience drive SMS. Post-paid cellphone charges range from 500 peso to 1,800 peso per month including free calls ranging from 20 minutes to 1,500 minutes. Beyond that a call costs 7.5 peso per minute peak rate and 3 peso off-peak rate, compared with 1 peso per SMS.

Table CS1.3
Cost Estimates of Network Elements in Philippines

Network Elements	Average Costs (ballpark figures)
Mobile Cellular	US\$50 per subscriber
Landline switching and equipment costs	US\$600 per direct exchange line
Landline transmission and connection costs	US\$400 per direct exchange line
Landline NGN routing and equipment costs	US\$200-300 per direct exchange line

Note: Landline networks built from scratch, or Next Generation Networks (NGNs) using Internet Protocol and routing rather than switching circuits, would be cheaper, the cost per DEL depending upon the class of services it is configured to provide, the scale of the exchange and discounts to the carrier. An ATM switch today would be under US\$400 per line and an IP-based NGN router below US\$250 per line. Local loop installation costs are a separate item and vary with terrain and distance. Most landline networks in the Philippines were installed in the 1990s or earlier. Source: interviews.

Little wonder then that pre-paid and SMS are mining new depths in the urban marketplace, the near-by or intensive margin, and rendering new geographical areas as commercially viable, the areas on the edge of profitability or extensive margin. For

⁴ Customer acquisition costs (CACs) include advertising and running discount and bonus schemes, but pre-paid avoids the processing of post-paid customer applications.

example Smart previously ruled out villages of less than 5,000 inhabitants as commercially not viable, but now actively seeks them out as costs per subscriber have fallen to around US\$50, thanks largely to the explosive growth in SMS.⁵ This compares with estimates for landlines on average of around US\$1,000 for the PLDT, of which approximately 60 per cent would be switching and equipment costs, and 40 per cent trenching and line costs. However, line costs over long distances in rural and more remote areas will be considerably higher.

Wireless and Universal Access for Voice

Is mobile cellular the answer to universal access for voice and text messaging services? And will wireless offer similar access to data services,⁶ notably the access to Internet? There seems to be little doubting that as handset prices fall to below 1,000 peso (US\$18) mobile cellular is already the *de facto* answer to access for many consumers in the Philippines, but not for people in the most remote regions.⁷ The issue is a purely commercial consideration for the mobile operators. As mobile cellular networks expand beyond the first tranches of higher income users average revenues per subscriber (arpu) tend to fall. Globe's net arpu for pre-paid fell 13 per cent 1Q 2004 compared with 1Q 2003, but this was more than offset by the growth in subscriber base of 23 per cent. The combined arpu for Smart and Pitel fell 12 per cent over the same period, whereas year-on-year subscribers were up 50 per cent. But for how long will growth in subscriber numbers outpace declines in arpu? More to the point, what happens to marginal revenue per user, and for how long will mrpu justify pushing back the geographical frontier?

Part of the answer lies in revenue generation, and part in cost reduction. On the revenue side the answer will lie with the marketing astuteness of the operators and the services they encourage people to use. But with purchasing power parity per capita income of just around US\$4,600, or just four to five times the cost of a handset, and a highly skewed distribution of income leaving marginal consumers with US\$1,000 or less in annual income, revenue generation in poor remote areas is unlikely to justify commercial operations for the foreseeable future.

Wireless Technologies and Universal Access to the Internet

Cost reduction looks more promising with forthcoming new wireless technologies. Perhaps most promising is WiMax,⁸ a broadband wireless technology that offers coverage over distances variously estimated between 25 – 50 kilometres. Currently it operates as a fixed wireless technology for the delivery of broadband services and as a long-distance backhaul for mobile operators and ISPs, but mobile versions are expected. Another technology is third generation (3G) cellular technology that will increase

⁵ Interview 6 May 2004.

⁶ Text messaging is not strictly “data” and pre-dates cellphones, for example with paging services, but in a packet-switched system based on Internet Protocol (IP) everything becomes “data” and company report frequently refer to SMS as data services.

⁷ For self-employed and semi-employed people remaining in contact for work while being mobile is a great advantage and having a cellphone soon pays for itself.

⁸ Worldwide Interoperability for Microwave Access (WiMAX) uses IEEE 802.16 and ETSI HiperMAN standards for last mile broadband access. In 2004, Hong Kong-based PCCW began deploying a non-standardized version of WiMax to deliver broadband services in the UK market.

network operational efficiency of spectrum usage, drive costs down and release resources for network expansion.⁹ Fixed wireless local area networks or WiFi already offer Internet access over 300 – 400 metres range¹⁰ and have been deployed by enthusiasts in residential and shopping areas as well as in office areas in developed and developing economies alike.¹¹ To date there seems to be little WiFi in the Philippines, but with directional antennae added to WiFi networks, elongated footprints are possible providing something akin to a mobile coverage. Software-defined radio (SDR) is yet another technology coming to maturity. SDR replaces the requirement for expensive base-station hardware with software that allows the network remotely to reconfigure and upgrade cell site signaling functions.

ACeS Satellite

PLDT also owns the Philippine space segment of ACeS, the Asia Cellular Satellite Corporation that is co-owned with PT Pasifik Satelit Nusantara of Indonesia, Jasmine International of Thailand and Lockheed Martin of the USA. ACeS can provide up and down links for cellular communications across a wide footprint of Asia, Africa and Eastern Europe. Deployed in the Philippines in 2002, it could be easily extended to rural areas.

Fixed-Wireless Convergence?

Traditional thinking sees a fixed landline network as essential for the delivery of Internet access, but in light of these new technologies wireless networks may be able to offer broadband over long distances at less cost. Two of these new technologies are currently fixed-wireless and in many countries they are being deployed by fixed rather than mobile operators, and logic might suggest that the next step is fixed-wireless convergence for the operators, and licensing convergence by the regulators.¹²

Convergence will defray the high costs of landline operators by maximizing the traffic carried over their legacy networks, giving economies of scope insofar as this involves converging services.¹³ High fixed costs are typical in the telecoms sector.

⁹ This point has been rather lost in sight of the public debate over the cost of 3G licences in Europe and whether there is a market for 3G. A knock-on effect of those licence costs and the debts incurred in meeting them has been the withdrawal of numerous strategic investors from Asia, such as BT, Deutsche Telecom, France Telecom and KPN of the Netherlands.

¹⁰ WiFi has been mostly implemented by fixed landline companies and for that reason has been regarded by some as a substitute for 3G implemented by mobile cellular operators. The prevalent industry view however is that 3G, WiFi and other technologies will converge as '4G' in the sense of offering seamless handoffs at high data speeds.

¹¹ For example, 'the rate of WiFi deployment in Indonesia is about 200-300 nodes per month' Onno Purbo (2004) *WiFi Development in Rural Indonesia* at <http://sandbox.bellinet.org/~onno/the-guide/wifi/ch-1-introduction.doc> at WSIS-Online. Onno Purbo argues that 'implicit knowledge' among the youth and the low cost of WiFi Internet access over unlicensed spectrum dispenses with the need for donor funds.

¹² India is the first country to converge fixed and wireless licences into one all service licence.

¹³ For example, Smart shares building and office facilities with PLDT, and is the largest single customer of PLDT's national backbone transmission network.

Table CS1.4
Proportions of Fixed to Operating Costs in 2002
(Percentages of Sunk Costs and Staff Costs)

Company	Fixed Costs	% Sunk Cost	Operating Costs	% Staff Cost
PLDT Fixed	95	79%	5	17%
Smart Mobile	71	61%	29	15%
Globe Consolidated	88	83%	12	13%

Note: Sunk costs assumed to include all telecommunications equipment and stocks of materials and to exclude all vehicles, land and buildings. Source: company reports.

Fixed costs are also a large part of mobile cellular operations, and although total costs substantially are lower than for landline operators, the imperative of achieving early wide network coverage (first mover advantage) generates its own economies of scale. As wireless technologies develop, two categories of services will become available for communication between fixed and mobile devices, peer-to-peer (P2P) services such as SMS, emails and file transfers, and person-to-machine (P2M) services such as the remote monitoring of buildings or remotely accessing a computer file. These modes of communication will offer economies of scope to the fixed and mobile operators who work together.

Foreign Partners and Debt Problems

The three leading telecommunications companies all operate fixed and mobile networks and they have each managed to weather the economic crises of 1997 and 2000 without becoming submerged by the growing debt as the peso fell in value.¹⁴ This is partly explained by some strong partnerships with overseas financial and strategic investors. PLDT and Smart are owned by First Pacific and partnered with NTT Communications and NTT DoCoMo, and Globe partnered with Singapore Telecom (Deutsche Telecom retaining an investment interest having been a partner of Islacom before the merger with Globe). Digitel had an early partnership with Cable & Wireless, but management differences led to a separating of ways, and although Cable & Wireless withdrew investments from the Philippines as part of its global restructuring, the company retains a close corresponding relation with ETPI for servicing multinational companies.

These successful partnerships contrast with those in Indonesia where the rapid depreciation of the rupiah and a shift in regulatory policy away from foreign joint ventures and towards an IPO model for state-owned PT Telekom and PT Indosat led to the collapse of four of the five KSO schemes. Singapore Telecom is the strategic investor in the surviving KSO. NTT was the most recent strategic investor to withdraw, all the others being companies from Australia, Europe and the USA. This suggests that pull factors outside of Asia as well as push factors from Indonesia were at work. In the Philippines the major exits were also non-Asian companies.

¹⁴ The National Plan (1993) used the managed exchange rate of US\$1: PhP25 and viewed US\$1:PhP20 as closer to the market rate. By May 2004 the rate stood below US\$1:PhP54. *National Telecommunications Development Plan, 1991-2010* (DOTC) Annex G-3.

Commercially powerful and politically influential families own all the major telephone companies in the Philippines, a point that may contribute to the apparent lack of merger and acquisition activity.¹⁵ Apart from the PLDT-Smart and the Globe-Islacom mergers there has been no other significant consolidation despite the landline over-capacity and debt problems,¹⁶ and as foreign ownership is limited to 40 per cent under the Constitution,¹⁷ strategic foreign entry is restricted to partnerships. Strong partnerships work in both directions. Foreign partners rely upon influential local partners to manage regulatory risk and to understand the local market. Domestic partners benefit from the credit-worthiness of the foreign partners along with their management and technical expertise. This is especially important for countries like the Philippines where currency risk is so strong,¹⁸ and where there is no long-term debt market, so loans usually have to be raised in US dollars.¹⁹ For example, in April 2004 Globe had no difficulty raising a US\$100 million five-year loan from a consortium of Singapore-based banks as part finance of a US\$350 million network expansion plan for 2004-2005.²⁰ During the 1990s the PLDT benefited from loan guarantees the JBIC gave NTT Communications for investments in the PLDT. Since then First Pacific Company, the owner of Smart, has become owner of PLDT.²¹

Service Areas Scheme (SAS) and Forecasting

The root problem for the fixed landline operators has been over investment and a failure of commercial planning at the heart of the Service Areas Scheme adopted in 1993 to open the market. From the 1970s under a ruling from President Marcos the PLDT was gifted a virtual monopoly over the sector when Piltel was ordered to stop rolling out additional landline network capacity²² and PLDT was awarded the universal service obligation

¹⁵ The Philippines is similar to Hong Kong in this respect, and to the private sector in Thailand.

¹⁶ BayanTel, the fourth largest carrier, is currently in receivership with estimated debt of US\$477 million.

¹⁷ Under constitutional law, foreigners cannot own more than forty per cent of a public utility. A commodity sector such as mobile cellular may not have all the characteristics of a utility, but since they are affiliated to landline companies this issue has not been addressed.

¹⁸ All companies enter into short-term foreign currency forwards to manage exposure to assets and liabilities denominated in foreign currencies, and into long-term foreign currency swap contracts to manage long-term foreign-currency denominated loans. For example, covering long-term loans as of 31 March 2004, Globe had US\$317.7 million outstanding currency swap agreements and US\$104.3 million notional value interest-rate swap agreements. Swap agreements covered approximately 55 per cent of Globe's consolidated US dollar denominated loans. Globe's total debt 1Q 2004 was US\$1 billion and debt:equity 1.08. PLDT's long-term debt YE2002 was US\$2.7 billion and debt:equity 1.7.

¹⁹ PLDT's debt is 89 per cent US dollars, 8 per cent Yen and 4 per cent peso.

²⁰ Another benefit to Globe came in January 2004 when Singapore Telecom made US\$225 million funding available to the C2C Holdings Pte, the consortium that owns the C2C submarine optical fibre cable connecting Philippines to other South East Asia countries.

²¹ The leading shareholder of First Pacific, which owned Smart, was the family of Indonesian tycoon Soedono Salim. Manuel Pangilinan was appointed CEO of PLDT. In 2002 an attempt to sell PLDT to John Gokongwei, the owner of Digitel, was thwarted by strong resistance from management, led by Manuel Pangilinan.

²² According to NTC data for 1991, PLDT operated close to 94 per cent of landlines, but only 47 per cent of telephone exchanges. Government carriers operated 20 per cent of exchanges, but less than 1 per cent of lines, leaving dozens of local carriers operating just over 5 per cent of lines from one-third of the exchanges. *National Telecommunications Development Plan, 1991-2010* (DOTC) p.16.

(USO) to be funded by cross-subsidy from its international revenues.²³ The results were not effective. During the period 1950 – 1960 the Philippines did reasonably well. For example, using Hong Kong as a benchmark the number of telephone lines rose from 40 per cent to 78 per cent of Hong Kong numbers, but by 1978 this had slumped to 28 per cent, and to 21 per cent by 1988. There were just over 600,000 telephone lines in operation in 1988 for a population of 65 million, over 80 per cent of them in Metro Manila, the National Capital District (NCD).

The SAS was a bold move in 1993 when the NTC set the licensing conditions to achieve an accelerated rollout of landlines to clear a backlog of revealed demand (waiting list) of over 800,000 and an estimated further hidden demand of one million.²⁴ Demand forecasts in the DOTC's updated 1993 *National Telecommunications Development Plan* used three models.²⁵ A top-down ITU methodology that forecast 4.4 million lines by 1998, and two bottom-up methodologies using municipal data (PLDT) and residential/business estimates (SGV/Teleconsult) forecasting 1.8 million lines and 2.2 million lines respectively by 2005. While none of these forecasts on their own can be called accurate, especially the top-down methodology, they do in fact frame the actual demand of just over 3 million in early 2004, suggesting the SAS licensing commitments were not well attuned to the National Plan.

What the SAS planners could not have foreseen, at least in detail, were two commercial developments. First, the surge in demand and substitution of cellphones,²⁶ and second the dramatic fall in international call prices brought about by international over capacity, proliferation of modes of by-pass of official tariffs and downward pressure on international accounting rates.²⁷ The consequences have been nothing short of radical for the economics of the industry and for regulation.

²³ Piltel became PLDT's mobile analogue cellular arm, and is currently being absorbed into Smart, the digital cellular company that became owner of PLDT. PLDT never had an absolute monopoly on international traffic. Both Philcom and Eastern Telecom Philippines Inc (ETPI) operated gateways but were instructed to make way for the PLDT. ETPI has a long established corresponding relationship with Cable & Wireless Hong Kong (CWHK) to route traffic, but PLDT refused to interconnect and relations were fraught with difficulties leading to very lengthy court proceedings.

²⁴ The SAS allocated sixteen regions and sub-regions to nine companies, requiring a mix of urban and rural, and a commitment to build 300,000 landlines in return for an international gateway licence and 400,000 landlines in return for a mobile cellular licence. Six companies, Digitel, Globe, Bayantel, PLDT, Smart and Piltel, met their targets. Isacom, Capwire, Philcom met their rural targets, ETPI failed to complete and Extelcom and Belltel failed to start.

²⁵ *National Telecommunications Development Plan, 1991-2010* (DOTC) Annex C.

²⁶ The National Plan forecast demand for cellphones of just over one million by 2004 based upon the two analogue networks of Piltel and Extelcom. Today there are 22 million subscribers.

²⁷ International call charges to the USA for both PLDT and Smart are down to 4 cents US per minute. Digitel is competing at 3 cents US per minute. Since 2003 Philippine and US carriers have been engaged in court proceedings regarding accounting rates, AT&T charging Philippine carriers with 'whipsawing'.

Table CS1.5
1993 National Plan Revenue Forecasts and Outcomes

	Forecast 2002: All Projects	Actual 2002 for PLDT
Total revenues	Ph.P 67,775 million	Ph.P 44,832 million
Local	22.5%	47%
Domestic long distance	13%	17%
International	63.5%	22%
Other	1%	14% (mostly data)

Sources: *National Telecommunications Development Plan, 1991-2010* (DOTC) Exhibit G-2A; PLDT Annual Report 2002-2003. Note: forecast figure is average for 1999-2004.

First, the revenues projected in the National Plan seriously overestimate and inevitably fail to capture the breakdown of service revenue sources. In particular, international and local exchange services almost reverse their proportions, undermining any policy based upon cross-subsidy. Second, by implication the traditional regulatory emphasis upon tariff rebalancing when the market is liberalized becomes irrelevant. In the Philippines rebalancing has in effect occurred with the spread of cellphones.

Governance Issues and Public-Private Sector Participation

The current view of the NTC seems to be that in retrospect a universal access fund (UAF) approach would have been more appropriate, allowing open competition and offering compensation to the company or companies with universal access obligations. A strongly held contrary view within the industry and among some industry observers interviewed for this Note is that such a fund would inevitably attract political interference and encourage misappropriation. In this regard a recent draft World Bank discussion paper has rightly pointed out that the regulator is given no autonomous funding, and political interference with key appointments is routine, so ‘the sector is essentially a hostage to political expediency.’²⁸

A prior issue is to determine the nature of the universal access issue itself and to what extent it goes beyond voice and messaging services to include broadband and Internet access. The Government in 2000 created an Information Technology and Electronic Commerce Council (ITECC) and subsequently a Commission on Information and Communications Technology (CICT) chaired by the Under-Secretary of the DOTC. It is expected that the CICT will eventually assume all the ICT responsibilities of the DOTC and NTC reporting will be directed to the CICT, paving the way for a more comprehensive agency for policy making and regulation. The universal access issue is currently part of the agenda of the CICT.

²⁸ ‘The “at pleasure” nature of the Commissioners’ terms of office is not in keeping with regulatory integrity.’ *Philippines Meeting Infrastructure Challenge Study: Telecommunications* World Bank Draft Discussion Paper, April 16 2004. The fact also that licences have to be awarded by Congress (or by Municipal authorities) before the NTC issues a Certification of Public Convenience and Necessity (CPCN) and that the whole process is subject to legal challenges further politicize the regulatory process.

Universal Access

Beyond the major cities, the Philippines is administratively divided into municipalities and barangay, or districts. The revised 1993 National Plan aimed to have 75 per cent of municipalities, which are mostly rural, with local exchange services by 2005. By 2005 around 35,000 barangays out of a total of 42,000 remain unserved because commercial operators under the Service Areas Scheme naturally gave priority to the more urban areas, and by the late 1990s meeting SAS targets was largely suspended.

The second string to the bow were two programmes funded in the 1990s by ODA assistance from the Export Development Corporation of Canada. The Municipal Telephone Project installed 500 'Public Calling Offices' or PCOs (telephone kiosks) in provincial towns and then handed them off to the Telephone Office (TELOF), an 'attached agency' of the DOTC that runs the 'Telecom Barangay' project. Phase 1 of the barangay (district) project established 3,470 lines in 347 barangays. Phase 1A aims to install 8,218 lines in 2,227 barangay and is considered virtually complete except in provinces disrupted by political unrest. Phase 2 was contracted in 1998 with funding from Credit de France and Standard Chartered Bank to provide 2,613 lines and switching facilities to the mountainous Cordillero Administrative Region in northern Luzon. The project stopped in 2002 as the local peso component of the project dried up with only 15 per cent of lines installed. Revenues from these projects have fallen well short of costs. For example, expenditures were PhP 1.1 million and revenues PhP 177,000 in 2002, attributed in part by the World Bank Draft Discussion Paper to TELOF employing 5,000 staff (around 40 per cent of PLDT staff. Not surprisingly, TELOF efforts to privatize projects met with little success, although the World Bank Discussion Paper also suggests the terms attached were too rigid.

Internet Access

According to the DOTC these PCOs and telecentres²⁹ can be equipped with data cards from the network to offer dial-up Internet access. Figures from NUA.com suggest in 2002 fewer than 8 per cent of Filipinos went online. This compares with under 2 per cent in Indonesia (2001) and Thailand (2000) but with over 25 per cent in Malaysia (2001). It also contrasts with over 50 per cent in Singapore and 60 per cent in Hong Kong. The digital divide in the Philippines is not simply a development issue, but also a social and political issue as the poorest and least served areas of the country tend to be in the Muslim south. The central Government lacks resources to address the issues fully and with urgency as a sliding value of the peso increases indebtedness, up by 17% 2003-2004. According to the Asian Development Bank, the Philippines is the second most active debtor in Asia after Japan, and has managed budget surpluses in only six of the past 30 years. Revenues in 2003 were just over 10 per cent of GDP, the lowest in Asia.³⁰

²⁹ The NTC's Memorandum Circular (MC) 08-07-2002 allows small, medium and micro-enterprises to invest in PCOs and telecentres. TELOF has built 5 telecentres in collaboration with the Departments of Agriculture, Science and Technology, the Interior and local governments.

³⁰ 'Debt service depletes funds to improve decrepit infrastructure, which stymies investors. Foreign direct investment plunged 82 per cent to \$320 million last year.' Jean-Pierre Verbiest, ADB, quoted in *The Philippine Star* 7 May 2004.

**Table CS1.6
Philippine Government Debt**

Government Debt	February 2004
Foreign	PhP1.755 trillion
Domestic	PhP1.651 trillion
Sovereign Guarantees	PhP0.723 trillion
Total	PhP4.130 trillion

However a notable feature of Philippine civil society is the vibrancy of its NGOs and community organizations.³¹ Many of them have active websites offering a range of free or low-cost ICT skills training, news and information services, B2B portals, and so on. A good example is b2bpricenow.com, funded with an InfoDev World Bank grant in collaboration with the Landbank’s Development Assistance Department, Unisys Corp., and an NGO, the Philippine Rural Reconstruction Movement (PRRM). The portal offers farmers price information allowing them to reach deals that are settled offline. By May 2003, two years after launch, transactions had reached PhP 3 billion and the portal had plans for online transactions with debits and credits to the farmers’ accounts at the Landbank, together with small transactions fees to fund the future sustainable development of the portal.

This is a particular hopeful example, but the obstacles to the spread of access and usage of ICTs have been highlighted by recent reviews of the situation. One is a National Statistics Office (NSO) survey based on 3,600 respondents, another is by the Asia Foundation using a non-random survey of SMEs and e-Commerce, and a third is an article in *Itmatters.com*.³² The following table summarizes their key findings.

**Table CS1.7
ICT Issues on Access and Usage**

Common Issues	
Lack of electricity	<ul style="list-style-type: none"> • Brownouts commonly affect SMEs, for example Internet cafes, even in areas close to the NCR. • <i>Itmatters</i>, ‘In fact, stumbling blocks to Internet growth like affordability, accessibility and awareness will be overcome by the evolution of the technology itself. Lack of electricity to connect to the Internet, for instance, will no longer be a limiting factor especially with the availability of WiFi and, two years down the line, with WiMax.’ (citing an ISP CEO)
Lack of telecoms	<ul style="list-style-type: none"> • NSO cites lack of infrastructure and low speed (64k) dial-up.

³¹ For example barangay.com is a portal based in Cebu to place barangay or regional ‘districts’ online, and digitalfilipino.com is a Manila-based portal offering ICT skills training and information services.

³² NSO 2002 *Survey of Information and Communications Technology (SCIT) of Philippine Business and Industry*; Emmanuel C. Lallana, et al., *SMEs and e-Commerce in Three Philippine Cities* (Asia Foundation, 2002); Kerlyn Bautista ‘The Connectivity Challenge: Ten Years of Philippine Internet Experience’ *Itmatters*, 29 March 2004. *Itmatters.com* is one of the best websites for IT matters in Philippines.

	<ul style="list-style-type: none"> • Asia Foundation finds 21% respondents cite lack of telecom facilities.
Lack of knowledge and basic ICT skills training	<ul style="list-style-type: none"> • Asia Foundation finds 29% respondents cite lack of knowledge and 18% lack of skills as impediment to using PCs and Internet. • <i>ITmatters</i> ‘we still need to have grassroots education for youth, who would educate their farmer parents on what Internet can do for trading... Indeed, an overhaul of grassroots education seems pressing, if one would go by the book Profile of the Information and Communications Technology Capabilities of Elementary and Secondary Schools in the Philippines, 2002.’
Business and Industry	
Lack of financing	<ul style="list-style-type: none"> • NSO cites lack of finance, hence lack of equipment • Asia Foundation finds 59% of non-users cite high cost of PCs and Internet access and usage.
IT investment given low priority	<ul style="list-style-type: none"> • NSC cites low priority assigned to IT by managers. • Asia Foundation finds 40% non-users ‘do not see the value of using the Internet for the businesses.’
Community	
Low incomes	<ul style="list-style-type: none"> • <i>ITmatters</i>: ‘While the cost of a PC has been going down, it remains beyond the buying capacity of typical Filipinos who receive a gross pay of US\$1,000 each year or about PhP150 a day. Still heftier than the cost of hardware is the money needed for bandwidth.’
High leased line charges for ISPs, schools, etc.	<ul style="list-style-type: none"> • <i>ITmatters</i>: ‘A leased line from Manila going to the US is roughly PhP175,000... PLDT will charge a leased line from Zamboanga to Manila about PhP175,000 a month... PLDT is also charging PH.Net US\$10,000 a month for a 64k line to the US. The amount had to be shared by 10 schools.’ (Citing ISP PH.Net)
Hierarchical distribution of PCs in schools	<ul style="list-style-type: none"> • <i>ITmatters</i> ‘About 85 per 100 public and private schools do not have computers. The case is appalling in ARMM and Regions VII and IX where 95-98% of schools do not have a single installed computer. Contrastingly, 90% of schools in NCR and Region IV have computers... PC distribution is skewed. Priority is given to the office of the principal, laboratories, as well as administration and faculty lounges, in that order of importance. A negligible 4% of computers are for classroom use. Moreover only 726 schools are wired. These schools are clustered in NCR, Central Luzon and Southern Tagalog Region, while CAR and Region XII are trifling with Internet connections.’

The issues raised in these reports highlight the general low level of access to ICTs due to a lack of infrastructure and the high cost relative to income, of ICTs such as PCs and handheld devices. Further, they highlight limited usage due in part to a lack of knowledge and skills training. One of the strategic questions the new CITC will need to address is how far access issues and usage issues can and should be addressed together. The holistic approach would require agencies that combine access and usage, such as telecentre projects, involving NGOs and community groups, local schools and health clinics and other places where people naturally assemble or can easily access the Internet. The big advantage of a holistic approach is economy of scope where scarce resources from various agencies can be pooled. Some disadvantages are the dangers of over-complex organization, difficulties of cross-agency coordination and rival sets of interests.

A separate approach, such as revising and extending the SAS to include Internet access has the advantage of focus, but still requires choice of agency. It would seem that the DOTC does not have the financial resources to subsidize such projects, as for example in the case with Phase 2 of the TELOF programme, or to run them with the same efficiency as the private sector. The proposal for a universal service fund raised by levy on the industry has been criticized for tempting fate in the form of misappropriation of funds. An industry preferred option is for incentives of some kind to extend network coverage, but would public tax revenue end up paying operators for what they would eventually do anyway for commercial reasons? A variant could be to offer tax incentives where local exchange carriers outsource operating facilities to barangays, NGOs and micro-enterprises on a revenue-sharing basis.³³ The tax revenue foregone could be recouped in part where these operations prove economically sustainable and where they help create local business and employment. Selective donor funding may be available, and if Government credit guarantees for micro-enterprises were also available that would help local banks offer loans at reasonable rates. Insofar as access involving wireless technologies is concerned, the NTC would also need to consider the terms and conditions of making radio spectrum available at the local level.³⁴ The chronic state of Government finances in the Philippines need not be severely shaken by such well-targeted micro-measures. One recent suggestion from the Department of Finance that worries the industry is the idea of a tax on SMS.³⁵ The record of regulatory financing does not bode well for this idea. The World Bank Discussion Paper points out that the NTC's revenues of over US\$25 million are roughly ten times its costs and these accrue directly to central Government funds. It is unlikely therefore that funds raised from a tax on SMS would be used to fund universal access.

Finally, VoIP is slowly spreading but is restricted to licensed carriers. Thought needs to be given to its availability over alternative modes of access, for example by WiFi, the use

³³ This policy could impose a time limit beyond which a universal service levy could be imposed if targets were missed.

³⁴ The 2004 draft World Bank Discussion Paper points out the NTC lacks the resources to enforce regulation and monitoring 'to ensure that allocated spectrum is in fact used effectively and efficiently.'

³⁵ Currently mobile phone services are levied 10 per cent VAT. All international calls are taxed and local charges are subject to a currency exchange rate adjustment (CERA) which is roughly a direct reflection of the value of the peso.

of IP phone cards, and the structure of charges, such as flat-rate Internet and VoIP usage to encourage adoption.

Conclusions

- Within the space of a decade in the Philippines telecommunications has been transformed from a conventional utility sector monopolized by the PLDT to a highly competitive commodity industry. Forecasting costs, revenues and demand in the early 1990s was still regarded as an engineering exercise based upon relative certainties, such as plot ratios, building targets, zoning plans, lead times for equipment ordering, and so forth. By 2004 uncertainty is the characteristic of the industry, due to competition for market shares on the demand side, and rapidly evolving technologies on the supply side, and subject to changing cycles of debt and cash flow. Typically, this is no longer an industry for major public sector investment.
- Two companies dominate the Philippine market for telecommunications, PLDT-Smart and Globe-Innove. Both offer fixed and mobile services as a result of consolidation and this suggests economies of scale and scope remain powerful barriers to entry despite falling equipment prices and network costs. In both cases also these companies have the backing of financially resourceful and politically influential families, and the benefits of financially, technically and managerially strong foreign partners. This backing helped stave off the worst effects of the falling peso and growing problems of debt within the industry.
- Mobile cellular telephony, especially pre-paid, is rapidly answering the demand for universal access to voice and messaging services. Mobile cellular networks are far less expensive to build, operate and configure to meet changing demand than landline networks and forthcoming wireless technologies will further reduce operator's costs. Handset prices are low and falling, and can be shared by families and communities. The structure and level of usage charges are highly competitive and conducive to widespread adoption even among the low-income members of society.
- Internet and ICT access and usage remain restricted because hardware is relatively expensive, landline infrastructure is inadequate or non-existent in many areas, and the structure and level of online charges not conducive to widespread adoption outside the corporate business sector. On the other hand, forthcoming broadband wireless technologies seem to offer opportunities for cost-effective service delivery to under-served areas. If the technologies are available, the recently created CITC needs to consider how best to give LECs and ISPs an incentive to adopt and deploy them.
- The issue of governance remains a problem for policy and regulation in the Philippines. This issue is important for public-private sector participation and for this reason it is an open question whether universal access is best served through a universal service fund that invites misappropriation or by adjusting the Service Areas Scheme to provide incentives to the local carriers to hasten universal access. A related option is to provide incentives to local carriers to outsource PCOs and telecentre facilities to barangays, NGOs and micro-enterprises, possibly on a revenue-sharing basis, with Government giving consideration to soft loans and loan guarantees to support the creation of sustainable local businesses.
- Government national debt servicing requirements severely restrict spending on universal access schemes. There would seem to be no commercial interest by major

investors in this area, and little by local exchange carriers. There is also the related problem of inadequate supplies of electricity to support telecentres and Internet cafes. The options would seem to be one or a mix of three: the incremental SAS approach, an ODA or donor approach, and a grass roots NGO approach exploiting the Internet and WiFi and other low cost alternatives that may require changes in regulation and municipal licensing policies.

Case Study Two (CS2): Mongolia

Mongolia, vast in area but small in population, has made substantial progress in telecom since the early 1990s through the use of grant aid and soft loans to finance several major network expansion and upgrade projects. In the mid-1990s Mongolia also began work on laying the foundation for a modern regulatory structure and privatizing the state-owned incumbent operator Mongolia Telecom (MTC). At the same time, Mongolia introduced competition by licensing its first mobile operator, Mobicom, and a few years later its second mobile operator, Skytel, both foreign owned.³⁶ As a result, Mongolia has experienced tremendous network and subscriber growth, particularly on the cellular side. Today, there are twice as many mobile subscribers as fixed-line subscribers. Mobile's success heralds the beginning of a 'virtuous loop' in Mongolia's telecom sector. However, Mongolia faces many telecom challenges, and foreign investment and public sector participation have vital roles to play.

1. Network Growth

The key network construction projects funded by donor aid - under the titles of Telecom 1, 2, and 3 phases - focused on making the switch in Mongolia's fixed network from analogue to digital by installing Alcatel digital switches and building out a nation-wide, long-distance optic fibre backbone transmission network (with equipment from Siemens) to connect the capital city of Ulan Bator to the country's 21 provincial centres, called aimags. Original funding came from the Asian Development Bank (ADB), the Nordic Development Fund (NDF), and the German Kreditanstalt für Wiederaufbau (KfW). The Mongolian government received nearly US\$50m. The European ODA institutions became involved because they wanted to support the involvement of European equipment vendors, and establish better relations with Mongolia. Later in the decade, the Japanese government, through JICA, and the Korean government, through the Korean Economic Cooperation Foundation, became active lenders to Mongolia's telecom sector.

The digitization project began in 1992. Now, the eastern part of Mongolia has optic fibre, finished 3 years ago, the northwest has some fibre, the western part has a digital microwave transmission link of 34 Megabytes run by Mobicom, and to northern Mongolia there is a digital microwave transmission link built 7 years ago. Additionally, the Mongolian Railway (or Railcom) has built a north-south fibre network following the railroad; this is fully digital and represents nearly 1500 kilometers of fibre. As a result of all this construction, 90 per cent of connections from Ulan Bator to the aimags are digital. In the south, two aimags remain connected via analog microwave. However, all aimags are connected via VSAT.

The next step focuses on improving the rural connections between aimags and the administrative units below the aimag, called sums, of which there are around 360-370 in Mongolia. Larger sums, like those situated at border points and a few others with populations of around 7000, connect to Ulan Bator via VSAT. Mongolia Telecom and

³⁶ KDDI (Japan) and Sumitomo (Japan) each own 44.4 per cent of Mobicom, SK Telecom (South Korea) and Taihan Electric Wire (South Korea) respectively own 25 per cent and 35 per cent of Skytel.

private VSAT network provider Incomnet provide VSAT to about 14 sums in all. That leaves 320 sums (with typical populations of 2000 or much less) connected to aimags via open wire and 40 sums via analog microwave. Open wire consists of stringing copper wire from pole to pole - wooden poles attached to special concrete poles as support - over many kilometers (100-200-300), from sum to sum.³⁷

Open wire might be adequate for voice but for data it is inadequate, and this is a key concern of Mongolia's Post and Telecommunication Authority (PTA), which wants to insure that the Mongolian public has access to a wide range of data services. Accordingly, the PTA has prepared a Master Plan for rural telecom development and submitted a US\$15m proposal to JICA. In it, the PTA has assigned different technological solutions according to how far a sum is from the capital city of Ulan Bator.³⁸

Public Switched Telecommunications Network (PSTN)

Mongolia Telecom (MTC) is the dominant fixed-line operator in Mongolia, with 130,000-140,000 subscribers.³⁹ MTC was structurally separated out of the Ministry of Infrastructure in 1992 and, in what was billed as the first stage of privatization, Korea Telecom (KT) took up a 20-year, 40 per cent stake in MTC for \$4.5m in 1995. MTC has been a very profitable company throughout most of the 1990s but with the advent of mobile competition, international VoIP competition and later on the substitution of international SMS for voice, its profit margins have been shrinking fast. MTC has been slow to respond. In 1999, 42 per cent of MTC's revenue came from international service, today only 10 per cent.⁴⁰ Amongst the service providers licenced by the Mongolian

³⁷ One aimag might have an average of 20 sums connected to it. The sums themselves are subdivided into 4-5 parts called bags, usually with 10-20 families. For every region, one centre point is chosen to connect to a 12 channel analog microwave multiplexer then a 3 channel multiplexer is used to connect to the other sums. The quality of service varies greatly. Many of these connections are 'iron lines with very bad quality' without a multiplexer, so only one call in one direction can be made at a time. Such poor infrastructure is partly the reason why, on average, only 5-10 phone calls are made a day per sum. Some believe that any basic improvement in infrastructure would, by itself, drive traffic up by an increase of 3-5 times.

³⁸ A sum that is situated at a "very far distance," more than 500km from Ulan Bator, will be connected via VSAT, a sum that is 100km away, or at a "middle distance," will be connected via digital microwave, and those sums that are at a "near distance," 30-40km, will be connected via optic fibre.

³⁹ Mongolia Telecom (MTC) has been one of the prime beneficiaries of grant aid because that aid has mainly poured into Mongolia's fixed network assets, funneled through the auspices of the PTA. This is a result of a rather unique proviso, under which MTC does not actually own the fixed network assets but leases them from the PTA, a government agency, and pays the Mongolian government an annual fixed charge. MTC then markets various services, from voice to leased circuits to Internet access (through its subsidiary company Micom). The percentage that PTA gets is not derived from MTC's revenue, nor from MTC's profit, but from a percentage of the assets. (MTC has also invested itself in some network assets, using its own internal resources to finance a wireless local loop project that has 10,000 subscribers.) The lease agreement is calculated based on the following formula: if the asset is a local network asset, the PTA receives 7.5 per cent of the asset value; if the asset is a national network asset PTA receives 7.45 per cent; and if it is an international asset PTA receives 12 per cent of the value. Rapidly dwindling returns on IDD has caused some friction between the PTA and MT, which is not particularly happy about paying the PTA a high rate of 12 per cent on its international network assets.

⁴⁰ In an interview, MT management admitted their biggest mistake was allowing Micom, its ISP arm, to provide VoIP services, thereby effectively cannibalizing MTC's own IDD services - 'eating the parent.' Micom, intent on generating revenue, has concentrated on VoIP to such an extent that MTC feels it has been neglecting its main line of business, the offering of Internet connectivity.

regulator to offer VoIP starting in 2001, three managed to capture 60-70 per cent of outgoing international traffic, in effect bypassing MTC's gateway. (See Part 4, Box 4.1 on disruptive technologies for more details.) On the positive side, interconnection with the two mobile operators Mobicom and Skytel has become a big source of revenue for MTC, accounting for 30 per cent. MTC's annual revenue amounts to slightly over US\$30m.

The second PSTN operator in Mongolia is Mongolian Railway, or Railcom. It has a north-south STM-1 fibre optic network that is 1405km long, which it upgraded to STM-4 capacity in January 2004. This has been funded partly through a loan from JICA for \$20m, administered through the state. Since August 2002, Railcom has been providing Internet access via fibre and leasing its network to other ISPs and the two mobile operators, where it is an important alternative to using MTC's services or to using a satellite. Its tariff for an E1 is \$2200-2700 a month, comparable to MTC's tariff of \$20,000 a year. Its network is interconnected with Russia's TransTelecom and China's Unicom and China's own Railcom. Since December 2003, Railcom has been passing international transit traffic from Europe to Hong Kong. It offers limited PSTN services to settlements along the railroad but so far has less than 10,000 subscribers. Its local voice tariff is 6 togrog a minute. It has made a formal application to the Communications Regulatory Committee and the Ministry of Infrastructure to begin work on an eastern fibre-optic loop, running off the north-south line, which will provide the network with redundancy. Railcom still awaits ministerial approval for the project.

Mobile Cellular

Unlike the fixed arena, where the Mongolian government could tap development assistance to fund network expansion and upgrades, for mobile those levers were absent. This forced the Mongolian government to turn towards the private sector for investment, and it has been richly rewarded for that decision. Both licenced operators, GSM Mobicom and CDMA Skytel, have experienced solid growth. First-mover Mobicom states that it has 350,000 subscribers (or prefixes sold) but the number of active users is closer to 180,000. Skytel has some 70,000 subscribers. Skytel's first mobile venture was an antiquated AMPS system but it quickly righted the ship and went with advanced CDMA services in 2001.⁴¹ One government official commented that 'when (the Mongolian government) first announced the tender (1995 for Mobicom, 1999 for Skytel) we never anticipated that there would be so many mobile customers, even children nowadays.' The growth has led the Mongolian government to bring forward plans to issue a third mobile licence for 900MHz GSM.⁴²

⁴¹ This is an example of where leapfrogging to the latest technology is the only commercially viable strategy.

⁴² Two questions on the mobile side are (1) will there be a market imperative for the mobile operators to extend their networks out to rural areas, to the sums, and to that part of Mongolia's population that is nomadic, moving and living off the land as animal herders and (2) with what the existing mobile cellular operators bill as market saturation in Ulan Bator with cellular penetration of 25 per cent will foreign investors be interested in partnering up with MTC or Railcom or some third party to bid for Mongolia's third cellular licence (more in section 5).

Mobicom's network reaches across most of Mongolia's major centres, covering about two-thirds of the country's population (but it should be noted that 1.5m of Mongolia's 2.5m population live in Ulan Bator) while Skytel is available in 7 provincial centres, with plans to cover half the country's aimags.⁴³ Skytel has been investing \$2-3m a year in its network, with a capex of \$5m committed for 2004, as it plans to unveil a CDMA2000 1x EVDO service in Ulan Bator.

The mobile operators have proven tough competitors for MTC, not only winning new subscribers, but, given their tariffing flexibility, also offering advantageous domestic long-distance (NLD) pricing plans.⁴⁴ (See Box CS2.1.) The mobile operators' cost structure is also quite flexible, compared to MTC's. For example, at the aimag level MTC employs 120 people (for perhaps 1000 customers) and makes an estimated turnover of 45m togrog annually. Where it has coverage, Mobicom achieves the same turnover but employs a fraction of MTC's staffing – in some cases, only 2 Mobicom employees in an aimag. An additional cost benefit is that the two mobile operators have enjoyed a tax holiday, consisting of an initial 5-year grace period with no tax obligations, followed by a 5-year period where they only have to pay half the tax rate.

As elsewhere in Asia, prepaid has forged ahead, accounting for well over 90 per cent of all mobile subscribers. (See the Philippine case study for equally high numbers.) However, Skytel has done reasonably well with a new postpaid plan called Business Class service, which has allowed it to make up some ground on Mobicom in the number of postpaid subscribers each operator has. For those who sign up to Skytel's Business Class service, introduced 2 years ago, the first 100 minutes of calling cost 7 cents per minute, the next 100 6.5 cents, the third 100 6, and so on. This innovative pricing scheme has enabled Skytel to acquire 5,000 postpaid customers in the past 2 years. For prepaid users, after their prepaid call minutes have expired rather than replenish the card they switch to receive-only mode – i.e. they send an SMS to a friend to 'call me'. This is a lucrative source of revenue for the mobile operators through interconnection levies. SMS, at 22-30 togrog per message, is on the rise. For Skytel, SMS revenue comprises about 10 per cent of the total. SMS interconnectivity between Mobicom and Skytel should be launched shortly. Number portability might be introduced in Mongolia by the regulator in 2006.

Mobile's success has created some expansion bottlenecks, particularly on the transmission side. Skytel complained that it had contracted with MTC for 16 E1s but according to MTC there is no additional capacity to be had. As a consequence, Skytel had to postpone rolling out service in western Mongolia. Mobicom has responded to this problem by building its own digital transmission network, to lessen its reliance on MTC's backbone network.

⁴³ Mobicom and Skytel leave sum level connectivity underserved.

⁴⁴ NLD is now the MTC's next vulnerable revenue stream after it lost the IDD market.

Box CS2.1: Tariffs in Mongolia

For mobile postpaid there are many promotions but the general price is about 6-10 US cents a minute (65 - 108 togrog). Mobile prepaid is US 20-30 cents (215 - 323 togrog) a minute. The fixed monthly subscription fee is 5,000 to 10,000 togrog (US\$4.5 - 9.0) a month. MTC's local tariff is a very low 7 togrog a minute or 0.007 US cents. (Before it digitized its network in mid 1990s, the tariff was 2 togrog a minute.) Long distance is almost 50 cents (539 togrog), depending on the area. Calls from Ulan Bator to "very near" cities cost 20-30 cents a minute. VSAT operator Incomnet charges 140 togrog (13 US cents) a minute but field equipment costs US\$7000-7500. So the use of a cellphone is more attractive for making long distance calls. Wireless local loop calls are between 50 and 200 togrog (US 5 – 19 cents) a minute.

Nowadays, after some initial FDI, investments are financed through retained earnings and short-term loans, mostly used to roll over previous loans. The local capital market, as yet, lacks the ability, liquidity, and depth to offer more sophisticated financing tools, such as bonds or long-term syndicated loans. This may have contributed to some disagreement between MTC's stakeholders over investment strategy, and it seems that the push to complete the second stage of MTC's privatization (see section 5) is partly a result of this, as well as the need to raise fresh funds. Overall, the three companies that have been recipients of FDI have shown a high degree of local initiative, with the foreign partners taking passive positions, more as technical consultants, for example when Mobicom is making the switch to GPRS or Skytel is outsourcing CDMA vendors.

Internet

There are seven ISPs in Mongolia and dial-up access costs around \$40-50 a month, which is prohibitively expensive for most Mongolians. However Internet cafés have sprung up to meet pent-up demand, charging 1000 togrog or less than \$1 per hour. Micom has been seen to benefit from its subsidiary relationship with MTC, especially in terms of Internet access outside Ulan Bator.⁴⁵ Affordable high-speed Internet access remains a serious challenge. Cost for dedicated broadband access (reliable ADSL) in Ulan Bator is \$400 a month.

Satellite

There are also some satellite and VSAT services, provided by MTC, Incomnet, and MCS, driven in part by a need to connect mining camps, truly remote areas where no other technology is available, and by national banking and treasury networks which have key data to transmit.

⁴⁵ MTC, the *de facto* wholesale monopolist, had earlier offered a flat tariff for all ISPs to make rural connections. As a result, the number of Internet cafés was growing fast in the countryside. But MTC decided to hike rates for all ISPs. Still Micom was able to keep a cheap tariff and all other ISPs were disconnected. The others had to pay telephony costs that made their services 15 times more expensive than Micom's. According to one ISP, the regulator is trying to intervene and fix this anti-competitive behavior but the effects have already been felt. By the time MTC adjusts its price, Micom will have covered all aimags and their customers. Micom's competitors must now rely on relatively expensive satellite links.

2. The Regulator – Communications Regulatory Committee (CRC)

In the mid-1990s, the CRC started out as a small part-time unit, comprised of 5-6 people, under the Ministry of Infrastructure, to which it submitted recommendation papers. The 2002 Telecommunications Law addressed the design aspect of regulation, by giving the CRC a more permanent standing and putting it outside the Ministry of Infrastructure as an independent agency. The move reflected one view prevalent in the Mongolian government (but perhaps not widely shared) that the role of government is to set up ‘independent regulatory institutions to insure independence of business... and to resolve the relationship between public and private.’⁴⁶ The CRC now employs 40 people full-time and has been busy issuing type approvals. Funding for the CRC comes from annual licensing fees and revenue from other routine regulatory services. One critical area for the CRC is spectrum management, as mobile has proven to be such a huge success. On this front, CRC is not only handicapped by a lack of experience but also by antiquated equipment which dates back to Soviet times. It is applying for 3 million togrog in aid money to install new equipment and spectrum planning software.

On the training front, the CRC has collaborated with the APT and sent staff to Beijing, Bangkok, and Singapore for courses. A lot more can be done on this front in aiding the CRC to keep abreast of international developments on the regulatory front. The ITU has sent over a consultant to help the CRC on modernizing its numbering plan.

The key question is whether the CRC will be given the wherewithal to be a reasonably autonomous agency, free to stand up to political interference and special interest pressure. The regulator is appointed by the Ministry of Infrastructure – the current regulator used to be technical director for Skytel, and has been given a 6-year contract. However, it is still too early to know whether changes in Government as a result of the recent elections will affect the regulator’s appointment or will delay agenda items such as the MTC’s privatization, tariff rebalancing, the setting up of a universal service fund, clarification of CRC’s role, etc.

To date, the CRC, from anecdotal evidence, seems to be behaving in a fairly independent fashion, much to the consternation of some of the operators, like MTC and Railcom who have viewed the CRC as ‘too detailed’ as one person interviewed expressed it, and ‘too curious in (the) internal operations of companies’ as another person put it. Others decry the suggestion to roll the CRC into one supra-regulator for infrastructure, fearful that such a move would impinge upon its independence. Some have gone so far as to suggest that the Mongolian government should bring in experienced foreigners, for a period of up to 6 years, to strengthen the CRC, outsiders who could ‘resist local pressure.’

A clear problem is that the CRC has not been given explicit powers. A lot of the statutory language is couched in vagueness such as ‘supervision and coordination’⁴⁷ regarding the extent to which the CRC can deploy its powers, and vagueness always results in disputes over the authority to make decisions and enforce them which in turn creates uncertainty

⁴⁶ Interview with member of Mongolia’s State Privatization Committee.

⁴⁷ From an interview with the PTA.

for investors. As far as tariffs are concerned, the CRC can only issue recommendations on what should be the appropriate calculation methodology but cannot actually intervene in determining whether a tariff is competitive or anti-competitive. If two operators are far from reaching an agreement, there is no legal recourse for the CRC to force a determination upon the recalcitrant parties. As one person interviewed put it, having ‘no weapon if the rules are broken (the CRC)) is begging and that doesn’t work.’ The laws guiding the CRC are also partly circumscribed because they involve elements beyond its control, such as foreign investment guidelines which are the provenance of the Ministry of Finance (MoF).

3. ICT and Telecom: Agency Coordination

The Ministry of Infrastructure is the principal agency for ICT policy implementation and coordination. It has an ICT Policy Coordination office which has issued several key documents outlining Mongolia’s ICT vision. Three important papers are the Telecommunications Development Policy document, IT Vision 2010, and a midterm ICT Strategy & Action plan which calls for 20 distinct ICT activities to be carried out in the near future. They are available in English and serve as a clear indication of into what sectors the Mongolian government would like to attract foreign investment. However, the ICT coordination office is made up of a tiny staff and its key function is more bureaucratic in nature, to thread together and embellish the vision and policy accents coming out of the Cabinet Secretariat.

The Cabinet Secretariat, under the Prime Minister’s office, has instituted an ICT Committee. All the general directors of the governmental bodies involved in ICT policy formulation are included. The ICT Committee makes decisions when to launch key policy initiatives, and is the reason why Mongolia has made the progress it has. The minimal amount of bureaucratic rancor and rivalry in Mongolia is impressive.

In the past four years, ICT has been elevated to a high development priority, with an emphasis on the outsourcing movement, particularly in software services. Mongolia set up a national IT park, home to the country’s major IT companies where researchers and staff develop local language content applications. There has also been considerable NGO involvement on the content side, in telemedicine and tele-education projects.⁴⁸ NGOs fill in gaps in funding policy research on Mongolia’s ICT needs, in bridging the chasm between policymakers and private sector, in funding actual programs with strong social benefits, and in incubating dynamic software startups. An influential NGO, Midas (Mongolian Information Development Association Scheme) has played an important role in facilitating the exchange of views between policymakers and the private sector as Mongolia prepares the IT and ICT laws.

⁴⁸ Many Mongolians feel that computer and Internet connectivity in schools, especially those in sum areas, with typically about 100 students each, should be one of the primary foci of government ICT policy. According to one person, ‘local government officials are 40-60 years old. They have no Internet experience, no computer (skills). We should concentrate on the next generation... Get rural school kids to touch a computer.’

Mongolia has issued several masterplans over the past decade, outlining what ICT and telecom objectives the country hopes to achieve. Masterplans are useful but their utility is circumscribed by geo-political and economic realities of changes in political leadership and development priorities, globalization and rapidly evolving and disruptive technology cycles. One criticism leveled at Mongolia's masterplans is that they tend to focus too much on technological outcomes, rather than on social aims and services, and are devoid of those policies and timetables by which social targets shall be reached.⁴⁹ The masterplan is replete with statements that Mongolian telecoms infrastructure by 2010 should have so much fiber optic, so much ADSL, and so many switches, reflecting an obsession with technical issues, which are always the easiest to resolve.⁵⁰

4. Private-Private, Public-Private Participation: Two Examples

Private-private and public-private participation is beginning to take shape and hold in Mongolia's telecom sector, reinforcing the 'virtuous loop' and closing, albeit in a very gradual and experimental manner, the investment gaps to be found in the sector.

The MCS Group's IP Hub is a new satellite service which has managed to attract a mixture of public and private funding. The project was launched when MCS won a competitive tender put out by the Ministry of Finance (MoF) to connect all treasury offices at the aimag level across the country and to install a new software system to consolidate and analyze government fiscal data.⁵¹ The first stage covers the 21 aimags of Mongolia and will be completed by November 2004. IP Hub will be able to carry out a wide range of services and applications, including video, fax, data, telemedicine and distance education. The MCS Group has also injected funds of its own to widen the IP Hub's scope of service to cover Mongolia's sums. MCS plans to subsidize the second stage of network expansion through services to government agencies located in the aimags, like the tax offices, the police, schools, hospitals, and more remotely, mining camps and tourist camps.⁵² IP Hub is one example of public-private participation that is beginning to nibble at the challenge of universal access.

The second example is one of a private-private partnership to provide an alternative network that addresses the high cost of broadband access in Mongolia, and bring it down to a price point that is more affordable for those Mongolians living in major cities – the "early adopters." Magicnet, a nimble Mongolian ISP, has begun a project to deploy cable modem Internet and is cooperating with domestic cable TV companies. They have just completed a successful test in Ulan Bator with Samsar TV and its fibre co-ax network. Magicnet plans to deploy a cable modem service to Ulan Bator homes and apartments later in 2004. Their customers eventually will be able to make voice calls over the cable infrastructure. If the collaboration with Samsar goes well, Magicnet plans to extend deployment beyond Ulan Bator by working with other regional cable TV companies. Today people in Mongolia pay a cable TV subscription of US\$3 a month for 40 channels.

⁴⁹ From an interview with the president of Incomnet.

⁵⁰ This maybe a carry over from Communist times when national physical product was the basis of national income accounting.

⁵¹ The World Bank assisted in the funding through a loan to the Mongolian government.

⁵² The second stage, to begin at the end of 2004, will aim to initially cover 180 sums.

Magicnet plans to offer cable Internet for US\$60 a month. Magicnet believes there is a market for cable Internet aimed at SMEs and SOHOs. By 2005, it expects to have 1000-3000 customers.

The two examples are both in the very early stage of implementation and execution. For both of them, the leap from preliminary planning to gaining a foothold and traction in the marketplace has yet to be made. But the fact that private-private and private-public participation are assuming the risk is grounds for optimism.

5. Challenges

Specific issues are to be viewed within the framework of two key challenges: (1) how to encourage private investment in infrastructure and (2) what is the changing role of the public sector. The following section examines four issues in the context of those two challenges, the four issues being (1) the third mobile licence, (2) tariff rebalancing, (3) MTC's privatization, and (4) a universal access and funding policy.⁵³

5.1 A third mobile licence - To attract further investment in mobile, should Mongolia award a third licence or limit the market to the existing two operators?

Despite having two very successful mobile companies, Mobicom and Skytel, the Mongolian government has decided to put out to tender a third mobile licence as the best way to attract further investment into the sector. The Ministry of Infrastructure's ICT coordination office is confident that there is still 'some market to get.' A mobile licence is attractive because 'fewer and fewer people are using wireline,' and winning that licence is critical to MTC's future plans. But will anyone else be interested, considering the high upfront investment in switches, cellsites to cover buildings, trunk lines, etc.? Another factor weighing on anyone considering a bid is that the third licensee, unlike the first two, will not be exempt from paying taxes.

On the plus side, the introduction of number portability might give a new entrant a significant boost. And MTC has some visible advantages in economically deploying a new cellular service by leveraging the existing infrastructure at its disposal. But any newcomer would stand to benefit from falling equipment prices, especially with the advent of Chinese equipment manufacturers.⁵⁴ One potential bidder for the third licence considered the breakeven point for a mobile operator in Mongolia to be 50,000 subscribers, and expected a rate of return of 19 per cent. It thought it could win 35 per cent of the cellular market 5 years from now, which it calculated to be 100,000 subscribers. Such numbers and returns are enticing, and give validation to the Mongolian government's decision.

⁵³ Other issues include making improvements to the backbone network (i.e. replacing digital microwave with fibre optic), increase Internet connectivity and bandwidth availability (perhaps by applying to the new American Millennium Fund), and reduce telecom tariffs across the board (with the exception of local voice calls), for broadband, for leased-circuits, etc.

⁵⁴ According to one Mongolian operator, 'China GSM equipment is 2-3 times cheaper than the European-made stuff – Alcatel will tell you \$6m and the Chinese can sell it to you at \$2.5m.'

One can expect competition to be intense and prices to fall even further. Both Mobicom and Skytel are well prepared to engage in price wars on voice. It will be interesting to see just how far Mobicom and Skytel have succeeded in introducing new wireless data applications and new revenue streams – over GPRS and CDMA2000 – before the new entrant reaches the market. This could prove a boon for Mongolian content SMEs. If that new entrant is MTC, it would be interesting to see if it focuses on currently under-served areas (i.e. aimag and sum levels), outside of Mongolia's 3 major cities, where its infrastructure advantage is strongest and if it's capable of unlocking the riddle of a cashless nomadic Mongolian society – (via prepaid?). All in all, it seems giving out a third mobile licence will be a greater spur to investment in the sector than protecting Mobicom and Skytel.

5.2 Tariff rebalancing⁵⁵ - Are mobile prepaid services pre-empting the need or ability to rebalance tariffs?

Where an incumbent's control of the local loop has usually been regarded as one of its prize assets, that has not necessarily been the case in Mongolia, where local fixed tariffs have been priced at a low 7 togrog a minute.⁵⁶ The MTC has put a request to the CRC (and the Ministry of Infrastructure and Ministry of Finance) to progressively increase the local tariff and rebalance eventually to a cost-recovery basis.⁵⁷ MTC plans to begin partial rebalancing by August 2004. According to its cost methodology, the cost of a local call within the PSTN is 18 togrog a minute. The MTC is calling for increasing the local rate to 9 togrog a minute this year, to 12 togrog next year, and then further up (to 15) until the tariff accurately reflects their cost.

What impact will the additional income generated by tariff rebalancing have on the MTC and the PTA investment model? It will not have an immediate impact on fixed network deployment because there are other factors at work in network planning and investment, and the MTC pays the PTA a percentage based on the value of the network assets, and not based on its revenue or profit.⁵⁸ As such, it is easy to understand why the PTA is not overly concerned with tariff rebalancing. However, tariff rebalancing is of paramount importance to the MTC. It certainly makes the MTC more attractive to investors when it privatizes (see 5.3). And it certainly will have a positive effect on the network investments that the MTC can make on its own accord, such as its WLL deployment, and

⁵⁵ Tariff rebalancing could play an important role in universal service, as MTC concludes that more than 200 sums operate at a loss today.

⁵⁶ Competitors look upon MTC's transmission network with greater envy than its array of twisted copper pairs.

⁵⁷ Politics play a big role here. Politicians are notoriously reluctant to vote for a tariff hike, especially before an election. Mongolian individual income levels are still quite low. There is also a perception, on the part of certain governmental departments, of local voice as a public utility good. A tariff hike is seen as levying a tax on the people. The MTC is also hampered by the fact that it is the PTA, or government, that owns the network assets. Rising personal incomes buoyed by economic growth could make tariff rebalancing more palatable in the future.

⁵⁸ The agreement between the PTA and MTC calls for the latter to make suggestions to the former on network planning and investment, with the PTA submitting a final plan to the Ministry of Infrastructure for approval. With the change in its fortunes, the MTC has become more vocal in commenting on PTA investment plans.

in the future. It is unlikely to change the pattern of calling very much unless mobile cellular prices fall dramatically.⁵⁹ Monthly fixed access charges of 5,000-10,000 togrog appear at first sight to be high but seem to have been factored in by the calling public.

5.3 MTC Privatization- is privatization the answer to making MTC a more efficient company, and to bringing in a fresh round of funds? How will the public sector's role change?

In 1999 Datacom, the consulting arm of Deutsche Telekom, was hired to come up with a privatization plan. Its recommendation was to transfer all network assets from the PTA to the MTC through a one-time sale, then award the MTC a mobile licence, and IPO the company domestically and overseas. For a number of reasons, including the change in government around 1999-2000, this did not happen and a golden opportunity was missed.⁶⁰

The Telecommunications Law of 2002 added a new wrinkle to MTC's privatization plans by excluding basic transmission that is connected via microwave, earth stations, and international exchanges from the transfer of assets to the MTC. After completing the transfer, the government's shares would be then privatized.⁶¹

Considering Mongolia's conditions, the current MTC management's preference is to follow the NTT model of Japan.⁶² NTT was privatized between 1985-1991. This is the model they will propose to government after the elections at the end of June.

We are elaborating our model and considering NTT's example... Our idea is to separate tentatively into MTC East, MTC West, and MTC Central – and to establish another company for international and long-distance. We have our daughter company Micom and we will keep it like that. Then there will be MTC Mobile. Over all of this, there will be one parent company, MTC holding company. Government should not own more than 51 per cent of this. We have had to deal with the big influence of government (good and bad). NTT is only 26 per cent owned by government in Japan

⁵⁹ 90 per cent of PSTN-mobile traffic originates on the PSTN network.

⁶⁰ One person, intimately involved with the MTC back then, felt this would have been the best possible plan in terms of the equity MT would have raised. 'In my time (at the height of the worldwide dot.com boom and before the legalization of VoIP], the MTC's worth was 10-15m US\$. If all the PTA's assets were injected, that was another US\$120m – long distance and international. Then issue shares and sell 51 per cent to a foreign strategic partner. If the government had done that back then, it would have sold the shares for lots of money.'

⁶¹ One issue to be resolved is what will become of Korea Telecom's stake? Does it have a right of first refusal? Could a third party step in via an auction and assume a strategic stake in MTC, displacing Korea Telecom in the process?

⁶² Unlike other countries, where labor unions are strongly opposed to privatization, Mongolia seems not to have this problem. From interview with MTC: '(MTC] cooperates with the trade unions and signed a mutual agreement recently this year. Over the last 2 years, many MTC employees have resigned or been given some form of early retirement. We're managing the cutoffs in the number of staff. When I took over 4 years ago (2000) MTC had 4700 employees. It's now down to 3900.'

(and this would be good for Mongolia too)... There will be some form of competition between these 3 parts – MTC East, MTC West, and MTC Centre.⁶³

Others disagree with this view. In particular, one opponent to this plan is the PTA which does not want to lose influence, as a government agency or network owner.⁶⁴ Its view is also strongly driven by a concern that a privatized MTC will be less likely to be involved in the upgrade plan the PTA envisions for the aimag to sum connection.

A Mongolian government agency should look at the network from a national perspective. If the PTA were to transfer all sums to MTC, it would close them down, because providing sum-level telecoms services isn't economical. We have discussed this issue several times with MTC. They have clearly stated that they're not so much (interested) in sum-level telecoms business. If they can't get an income from the connection, MTC will leave it to another organization. That in effect means nobody so the sums will just close.⁶⁵

The PTA views its role only decreasing 'by 20-30 per cent' after MTC's privatization.⁶⁶

Many feel that the PTA should retain control of the transmission network – which is what the Telecommunications Law 2002 sets out to do. This is fueled by resentment over MTC's perceived favoritism towards Micom in leasing out valuable transmission capacity, as competitors wait for orders to be fulfilled. They also advance the argument that the government would be, through this approach, facilitating fairer competition, and the revenues could be one conceivable source for universal service funding.⁶⁷ Others feel such a move would be a terrible mistake and drastically lessen MTC's value. Another fixed competitor found the whole idea of MTC agreeing to the PTA owning all transmission assets 'befuddling.'

To complicate matters, there are those within the Mongolian government who have no qualms about the PTA losing out on the transmission network. Citing that '80 per cent of total national GDP comes (already) from private companies,' they feel strongly that

⁶³ From interview with MTC.

⁶⁴ The PTA, as a government agency, is therefore an eligible recipient of grant aid. The grant aid issue could be finessed by having grant agencies, where possible, lend directly to Mongolian commercial banks and companies. Apparently KfW has started to do this, bypassing the Mongolian government and lending directly to banks, thereby exerting some downward pressure on the high interest rate companies have to pay on bank loans.

⁶⁵ From interview with PTA. The PTA's fear seems to be well-grounded. MTC management said the following in an interview, 'after privatization, the executive management will follow the path of profitability, not just government policy. We will close inefficient businesses and go for the more efficient ones.'

⁶⁶ From interview with PTA.

⁶⁷ Another issue with the transmission network is who would assume the responsibility of paying off the loans that financed its construction in the first place – the privatized MTC company or the Mongolian government? This debt overhang might tarnish MTC's attractiveness to investors.

public assets should be in private hands, that the Mongolian government should be 'leading' policy, and that there should be no 'government participation in business.'⁶⁸

The question is when will all the issues surrounding MTC's privatization be resolved and how. Optimists feel this will happen by the end of 2004. But with a final decision yet to be made on hiring consultants – in a collaborative effort between the Mongolian government and the World Bank and the European Restructuring and Development Bank – the process could be delayed for a while longer.

In the final prognosis, it can be assumed that with MTC's privatization, the role played by the public sector (i.e. the PTA) is set to fundamentally change in all ways but one, and that one is universal access, where the PTA's role is set to increase.

5.4 Universal Access & Funding - what should be the roles of the public and private sectors in funding universal access? What is the appropriate mix between the two?

This is a big debate in Mongolia, that everyone living in the countryside should have access to basic telecom services, and probably will not be resolved until after MTC has undergone the second stage of privatization. One impression is that there is widespread awareness in the public and private sectors about the importance and necessity of realizing universal access, not only to voice but to ICT (i.e. Internet) as well.⁶⁹

Operators are reluctant to provide rural access because it is unprofitable.⁷⁰ This is partly due to Mongolia's unique geographic and socio-economic conditions. Rural society is marked by a nomadic way of life, of families herding their animals, and coming to market on only a handful of days a year.⁷¹ The sums themselves are widely dispersed, many in geographically remote and hard to access areas, many not connected to the central electricity grid. People in sums drawing a regular salary are also few in number.⁷² And as noted earlier, rural connections are through open wire.

⁶⁸ 'If profit, government should not be involved (outside of collecting taxes).' This is a view held by some members of the State Privatization Committee.

⁶⁹ Universal access is important not only because of urgent need when someone is sick or ill and in need of helicopter evacuation. (Emergency services are currently handled through the radio band.) But Mongolian herders could also benefit from access to greater information and value-added services, such as weather news and even perhaps some form of e-banking. Extremely cold winters in recent years have wiped out a huge portion of Mongolian herds. This economic disaster might have been averted or mitigated through better and more timely information dissemination.

⁷⁰ For those companies without the resources of say an MTC, there is minimal interest in universal access. One independent ISP framed the business proposal along the following lines, 'There are on average 10 calls from Ulan Bator to each sum and 5 calls from sum a day. Banks make about 3 transactions a day to their branches out in the countryside through one channel. How to make a profit under such circumstances? Impossible.'

⁷¹ 'Nomadic people have money twice a year, when they sell wool and when they sell meat. (It is] not a cash economy in rural areas,' from interview with Ministry of Infrastructure.

⁷² 'How many people are employed in a sum, people who receive a monthly paycheck? Teachers – there are 10. Doctor? 1 and 4 other staff at hospital. Sum administration – 8 people. What they're paid is less than \$100 a month.' From an interview with a service provider.

A couple years ago, in passing the revised Telecommunications Law, the Mongolian government sought to create a Universal Service Fund (USF) obliging telecom operators to contribute 5 per cent of their net revenue.⁷³ The CRC was designated as the collector of funds, to be spent by the PTA under approval of the Ministry of Infrastructure, which would decide how to spend the USF, for what projects, and for which sums. However, this scheme was not approved by the Mongolian Parliament, after intense lobbying on the part of the mobile operators, who as private companies felt they already paid a tax to the government and now were being asked to make an additional contribution.⁷⁴ The mobile operators found the government's argument unconvincing, that by extending their networks out to Mongolia's herders, the operators would be able to sell more services, have more customers use their networks, and consequently drive up their income.⁷⁵ As of this moment, the mobile operators are free to make a donation if they want but have no legal responsibility to do so. With the MTC, when the agreement was signed by the Mongolian government in 1995 with Korea Telecom, there were provisions for Korea Telecom making an investment in rural access. But, according to one official, it 'was not must (invest)... We wrote maybe.'⁷⁶

The mobile companies came up with their own USF proposal that all subscribers should contribute 500 togrog, or half a dollar, per month. This sum would be collected by the operators and donated to the CRC and the Ministry of Finance. Under such a scheme, it would be abundantly clear what contribution each company would make.⁷⁷ Then the CRC, together with the PTA and Ministry of Infrastructure, could auction off different rural connectivity projects.⁷⁸

The PTA rejected the notion of charging subscribers 500 togrog for a USF contribution because they saw it as an increase in the tariff Mongolian consumers must pay, and therefore unacceptable considering people's low incomes.⁷⁹ It envisions instead covering

⁷³ In Mongolia, that would have meant contributions from only 4 companies – MTC, Railcom, Skytel, and Mobicom.

⁷⁴ To them, this smacked of double taxation. 'What private investor would want to come then to Mongolia?' said one operator.

⁷⁵ The mobile operators have been content to cherry pick those areas that offer them the maximum return on their investment, meaning they have concentrated on Ulan Bator.

⁷⁶ From interview with Ministry of Infrastructure ICT coordination office. In actuality, the MTC is quite willing to make a contribution to the USF because it is the only one with a universal service obligation, and therefore entitled to draw funds from the USF. The mobile operators are not, hence more grounds for their opposition. Railcom is providing some form of universal access (i.e. investing in something not profitable) by offering service in 55 small settlements, as part of a plan to develop the railroad company's own communications needs.

⁷⁷ So no need for the CRC to inspect company ledger books.

⁷⁸ One of the mobile operators also felt that the PTA would be better suited to oversee the USF, and not the CRC. 'The CRC is not the right person for the job. They're a regulatory body... (They should be] judge of the game, look at operators' game, and make sure (everyone is] playing fair. On financial issues, PTA (the state) is the right person. They're the ones managing all the assets and investing in the telecoms sector. They have the necessary financial experience, what's needed.' Another operator suggested the establishment of a 'separate telecoms financial institution, a non-banking financial institution, to manage and distribute the USF where necessary.'

⁷⁹ Technically, the PTA seems fixated on a wired approach to universal access because it can tap grant aid (from Japan) and this would allow it to continue to play a significant role in network management, after

all its bases and exploiting several funding sources: (1) government seeking grant aid from many international donors, (2) the CRC getting some income to finance the fund from licensing fees, and (3) all private companies paying CRC an annual charge, which it collects to use as a subsidy for universal access.⁸⁰ This mix of public and private sector funding seems to be the likely way forward, the optimal Second Best solution.

The World Bank has become involved in the process and hired a Canadian consulting firm to research universal access funding and pilot projects.⁸¹ Their report should be completed by September 2004 and the technical project(s) launched next year. Revisions of the Telecommunications Law and various tax laws might also have to take place for universal service funding to become a reality.⁸²

6. Lessons

Mongolia is a growing market but it still has many key issues to resolve. If it resolves them, Mongolia's telecoms sector could witness growth rates that surpass those of the 1990s.

- Mongolia has carried out a successful transition from the Ministry model to the PTA model 'with Mongolian characteristics'. But the model is no longer appropriate. With the rise of mobile telephony, the intrusion of VoIP and MTC's privatization on the horizon, the PTA investment model is in need of replacement.
- Looking at the process of how to move beyond this model, there are two forces at play. One, policy and regulatory reform is slow and difficult, for it requires political consensus. Yet decisions have to be made regarding MTC's privatization, the third cellular licence, etc. Two, there are significant private sector initiatives – Mobicom, MCS, Skytel, Magicnet, etc. Are they sufficient to trigger a 'virtuous loop'? Yes, in all probability, with mobile subscribers already double the number of fixed line subscribers and growing, with private-private and public-private partnerships on the rise, with the MTC's privatization (especially if it is more complete than partial) and in conjunction with the forces of reform and greater openness sweeping through Mongolian society and its economy. However, it is important to note that the 'virtuous loop' is in its infancy in Mongolia, with most of the mobile growth slated to take place in urban areas over the next five years.⁸³ There are short-term nibbles

MTC is privatized. Some at the Ministry of Infrastructure feel that perhaps in 5 years time there might be a shift to mobile technologies in improving rural people's accessibility to infrastructure, coinciding with a time where rural income levels might be high enough, and mobile prices low enough, for them to afford cellular services.

⁸⁰ Getting all three will require considerable political acumen, necessitating the involvement of a determined Cabinet Secretary and Prime Minister.

⁸¹ Considering Mongolia's huge landmass, VSAT might also figure to the universal access picture. At what appears to be a reasonable cost of US\$5000-7000, some satellite companies like MCS and Incomnet are seeking the financial means to connect up sums. One form is to get lucrative governmental and banking contracts to cross-subsidize call centres in sums.

⁸² One concern shared by all is that there be a much clearer legal framework for the USF – absent in the original formulation in the 2002 Telecommunications Law.

⁸³ Despite a 25% penetration rate in Ulan Bator for cellular, there will still be a lot of demand due to demographic changes, the introduction of new services and wireless technologies and rising prosperity;

being made at universal access, such as MCS's IP Hub satellite, but the PTA will have to play a bridging role here.

- Under the current investment model, the PTA's focus is on upgrading the open wire and universal access. Is this slowing down or diverting financial investment that would be put to better use in other sectors of the market? No, as stated above the 'virtual loop' is in its initial stage, the MTC's privatization will free it to pursue its own network investment agenda, while the PTA realizes the need for a new model and is not behaving in an obstructionist manner. As such, the PTA seems intent on drawing upon all possible sources to fund universal access in what is the most politically and fiscally feasible solution. Donor aid will continue to play an important role here, and aid agencies and NGOs will work closely with the PTA and CRC to devise a USF that is transparent, pragmatic and strengthened with incentives. Mongolia as a whole stands to benefit from a PTA that is focused on universal access and from a 'virtuous loop' dynamic in the private sector.

Hong Kong has a cellular penetration of over 100% and supports 6 mobile cellular operators, all turning a profit. Ulan Bator is far from being saturated.

Case Study Three (CS3): The Pacific Islands

Geographically and culturally, the Pacific Islands can be divided into three sub-regions: Melanesia, Micronesia and Polynesia. In the north Pacific, Micronesia lies between Hawaii and the Philippines and is broken down into seven island groups. In the southwest Pacific, Melanesia curves down from Papua New Guinea to the Solomon Islands, Vanuatu, New Caledonia and Fiji. In the southeast Pacific, Polynesia, the largest island group consisting of eleven island nations, stretches across a triangle from New Zealand in the west to Easter Island in the east and north to Hawaii. Politically, about half the Pacific Island countries used to be colonies or dependencies of the UK, France, Australia, New Zealand and the USA, gaining independence in the 1970s and 1980s. The rest are either overseas territories or protectorates of France (French Polynesia or Tahiti, New Caledonia, Wallis & Fortuna), the UK (Pitcairn), New Zealand (Tokelau), the USA (Guam, American Samoa) or in free association with New Zealand (Cook Islands) or the USA (Federated States of Micronesia, Marshall Islands, Palau, others). Demographically, populations are very small, a total of 8 million spread across 30 million square kilometres of ocean,⁸⁴ and their distribution highly skewed, with 80 per cent live in Papua New Guinea, Fiji and the Solomon Islands.

The Pacific Islands share in common geographical isolation, severe cyclones, a high dependence upon donor aid, and in many cases a paucity of natural resources. Because of the great variation of physical, demographic and economic size, language groups and cultures, they constitute a very diverse community of interests. The Pacific Islands Forum Secretariat (2003)⁸⁵ summed up the situation as follows

Generalizations about the Pacific Island countries (PICs) are therefore not very useful. Understanding each country's unique situation is the key to ICT sector analysis, planning and policy development across the region. (p.3)

Telecommunications

Table CS 3.1 shows fixed and mobile teledensities and market status as either M for monopoly, P for partial competition and C for competition. With the exception of Tonga in Polynesia and Kiribati in Micronesia, fixed-wire telecom services are still provided under monopolies, in most but not all cases state-owned.

Teledensities, both fixed and mobile, vary considerably across the Islands, with fixed ranging from below 1 to over 61 per 100 people and mobile from none to 38 per 100 people. Variations within the sub-regions are just as large. In Micronesia, Timor Leste's teledensities are 0.26 for fixed and 1.5 for mobile compared with 35 and 10 in Palau and 48 and 34 in Guam. In Melanesia, Papua New Guinea has fixed and mobile teledensities

⁸⁴ The scale of the Pacific Ocean varies according to definition. The CIA Handbook which for its definition of the Pacific Ocean includes the Bering Sea to the north, the Tasman Sea to the south and every tributary waterway in between, measures the whole area as 155 million square kilometres.

⁸⁵ 'Pacific Islands Regional Input Paper: Asian Regional Conference for the World Summit on the Information Society, Tokyo 13-15 January 2003'
www.forumsec.org.fj/division/DEPD/infra/ICT/pacific_AP_conf.pdf

of less than 2 and 0.3 in contrast to New Caledonia's 23 and 36. In Polynesia, fixed and mobile teledensities range from 0.02 and none (Pitcairn) to 61 fixed in Niue and 38 mobile in French Polynesia (Tahiti). By 2002 only in Fiji, New Caledonia and Timor Leste did mobile subscribers outnumber fixed line subscribers, but since then pre-paid mobile has made rapid gains and New Caledonia has become the first Pacific Island to install a 3G network from Alcatel. Pitcairn, Tokelau, Tuvalu and Wallis & Futuna are the only Islands not to have mobile cellular networks.

Table CS3.1
Pacific Islands Telecom Status

Country	Region	2002 Population (‘000)	2002 GDP per capita US\$	Teledensity 2002		Competition	
				Fixed	Mobile	Fixed	Mobile
America Samoa	Polynesia	70.2	8000	0.21	0.03	M	C
Cook Islands	Polynesia	14.3	4950	45	9.5	M	M
F.S.Micronesia	Micronesia	118	2070	10	3.4	M	M
Fiji	Melanesia	824	2068	11.9	10.97	M	M, Sat = C
French Polynesia ¹	Polynesia	265.1	16613	21.9	37.49	M	M
Guam	Micronesia	163.9	21000	47.9	34.4	M	C
Kiribati	Micronesia	90	700	13.4	0.6	M	M
Marshall Islands	Micronesia	51.8	2210	8.24	1.11	M	M
Nauru	Micronesia	11.5	3900	16.5	13.04	M	M
New Caledonia	Melanesia	210.8	13940	23.2	35.71	M	M
Niue	Polynesia	1.9	3710	61.1	5.6	M	M
N.Mariana Islands	Micronesia	80	12500	0.26	0.03	M	M
Palau	Micronesia	19.1	8030	35.1	10	M	M
Pitcairn	Polynesia	0.047		0.02	0	M	na
PNG	Melanesia	5460	777	1.13	0.27	M, Sat = C	M
Samoa	Polynesia	169.2	1060	6.53	1.5	M	M
Solomon Islands	Melanesia	447.9	396	1.49	0.22	M	M
Timor Leste	Micronesia	820	494	0.26	1.5	M	M
Tokelau	Polynesia	1.4	1000	0.2	0	M	na
Tonga	Polynesia	100.2	1870	11.29	3.38	C	C
Tuvalu	Polynesia	9.9	1160	8.6	0	M	na
Vanuatu	Melanesia	199.8	1230	3.27	2.42	M	M
Wallis & Futuna	Polynesia	15.5	2000	12.96	0	M	na
Average for PICs				14.8	8.7		

Note: 1. Also known as Tahiti. M = monopoly; C = competition. Sources: Commonwealth Telecommunications Organization, 2004; <http://www.totel.com.au/asia.asp?country=453054482>; Teledensity for American Samoa and Northern Marianas from CIA Factbook, 2000.

International Telecommunications

Besides Papua New Guinea, only two islands, Fiji in Micronesia (Southern Cross network) and Guam (USA) in Melanesia (PACRIM West and TPC networks) are connected to submarine cable systems. All other islands have to rely upon expensive satellite communications for international telecommunications, although this is a major step forward from the days of HF (High Frequency) radio and steamships.⁸⁶ Even within

⁸⁶ A good example of the high cost of international calls comes from Samoa where a 3 minute call to the USA costs \$4.20 while a similar call from Australia to the USA costs \$0.42¢.

island groups distances can be huge. For example, the Cook Islands consist of 15 islands spread over 2.2 million square kilometres with a population of 14,300. In some cases, such as the Federated States of Micronesia, isolation is coupled with mountainous terrain and rendering line-of-sight microwave communications of little use. These enormous distances and relatively small populations are major difficulties in deploying national telecommunication infrastructures and providing cost effective telecom services. In 2003 Cable & Wireless, who are involved in Fiji, Marshall Islands, Solomon Islands and Vanuatu, proposed a Pacific Island Cable System that would connect Australia with almost all the Island nations at an estimated cost of US\$265 million.⁸⁷ To date the proposal has not gathered momentum due to insufficient expression of interest.⁸⁸

The economics of international telecommunications are not favourable to bringing the Islands together to share costs. Pacific Island countries are not connected directly to each other but to the USA, Australia, New Zealand, and very little traffic is exchanged between them as their respective 'communities of interest' are not with other Island nations but with places of migration and trade.⁸⁹ For example, an estimated 100,000 Samoans live overseas, mostly in the USA, Australia and New Zealand, while 140,000 remain in Samoa. International calling patterns reflect these numbers. Outgoing calls from Samoa between 1991-1996 rose from 2.9 million minutes to 3.7 million minutes, while incoming calls rose from 4.2 million to 9.8 million (Withers, 1998)⁹⁰ reflecting the basic callback pattern whereby family, friends and business associates overseas who enjoy higher incomes and lower calling charges will either initiate calls or return calls. Net income from international accounting and settlement rates is always an important source of foreign currency for developing countries and in Samoa's case in the mid-1990s these net payments represented 5.7 per cent of GDP. In the Solomon Islands they came to 4.7 per cent of GDP. This not only means that changes in international accounting rates imposed by the US FCC have had a significant impact on the Island economies - the subject of Withers (1998) - but that any reduction or by-pass of IDD rates impacts upon the financial ability of the local telecom authority to build the local infrastructure.

⁸⁷ C&W were trying to take the opportunity at a time 'whilst the telecom industry is contracting, to focus on the Pacific geography rather than the historical growth markets in US, Europe and Asia.' The proposal did not get beyond the 'initial business case' stage. See

<http://www.pacificforum.com/ict/conferencereport.doc>. At an APT meeting it was stated that it was 'not commercially viable and therefore can only be justified on social benefits', that it had high capital and O&M costs and would only serve capital cities. A proposal from French Polynesia favoured a regional satellite leasing approach that would serve the outer islands and at much lower cost. See

<http://www.apsec.org/meetings/2004/wsis/Presentation%20Papers/9>

⁸⁸ Interview with Cable & Wireless.

⁸⁹ A serious problem for Pacific Islands is when 'people get skills, they often leave the Islands. And when they leave they don't come back.' <http://www.pacificislands.cc/pm12003/pmdefault.php?urlarticleid=0005> Equally problematic is the fact that in some cases migration results in a net outflow of funds as extended families migrate overseas. For example, the IMF and World Bank estimate a net outflow from Niue to New Zealand every year, see 19/10/2002 'Niue Constitution Day' <http://www.webpost.net/nb/nbn>

⁹⁰ William Withers (1998) 'The Changing International Telecommunications Environment: Samoa Case Study' ITU - www.itu.int/osg/spu/wtpf/wptf98/cases/Samoa/samoafi1.pdf

The general argument of this Telecom Note has been that (a) the economies of scale and of scope and network externalities exert a powerful influence on the economics of the telecom sector; (b) these tend to counter-balance the cost-reducing effects of new technologies, and therefore even in open markets the outcome is most likely to be oligopoly competition in infrastructure; and (c) economies of scope offer a range of new revenue opportunities that allow for a change in business models away from a reliance on voice revenues. One of the implications is that while tariff rebalancing is an economic requirement, in practice it is likely to accelerate the substitution of mobile wireless and Internet Telephony by computer phone for traditional fixed line calling. This set of arguments is more difficult to apply to the Pacific Islands because of an apparent lack of economies of scope, but may nevertheless still influence the course of events.

The problematic starts with the rebalancing issue. Withers (1998) states the issue precisely in his case study of Samoa but in terms of a traditional paradigm that sees (a) the regulator influencing or even fixing prices, and (b) the fixed-wire as the primary means of access to high-speed connections.

In terms of domestic price levels, consideration will need to be given to price levels for cellular-mobile services relative to those in fixed-wire services in the interests of optimizing the overall price structure and thereby fostering the effective and efficient development of the overall information infrastructure. For example, the current level of cellular mobile prices for access and usage have established a 'price-ceiling' for basic network access and usage and therefore limit the extent to which fixed-wire local access and domestic usage prices may be increased. As a result, any price re-structuring of domestic fixed-wire services undertaken in conjunction with decreases in the price for international services are limited in terms of shifting the revenue requirement from international services to domestic ones.

Given the current interconnection arrangements, sender-keeps-all, the longer term result of such a shift in demand could be undermining of the financial resources available to the fixed operator for further development of the wired infrastructure. Given the need to make available such services as Internet access and higher speed access capabilities for health and education services as well as dedicated high speed services for both business and government, it is essential that the appropriate balance be struck between the development of cellular-mobile network and the underlying fixed-wire infrastructure. (pp.6-7)

This statement is logical, but it may have become less relevant to actual or future developments. First, it should be noted that access to telecom 'is generally good in urban areas, but generally very poor in rural areas.'⁹¹ Because of large household size and

⁹¹ 'Although urban teledensities ranging from 20 to 60 per hundred of the population are low by global standards, when household sizes and social patterns are taken into consideration nearly all urban residents have access to telecommunications services. Rural teledensities however range from one half to one tenth of those in urban areas.' Pacific Islands Forum Secretariat (2003)

communal customs, infrastructure can be widely shared. Second, if the major concern is about access to Internet and the benefits of using ICTs, it would seem that price rather than access in urban areas is more the prohibiting factor. 'Pacific Islanders typically face connectivity charges that are among the highest in the world. Subscription and usage charges for dial up access to the Internet range from US\$3 to US\$175 per month, with an average of US\$50. On an annual basis this amounts to one quarter to one half of the average annual per capita GDP in many countries and is clearly unaffordable by the majority of people.' (Pacific Islands Forum Secretariat, 2003, p.4) Because Internet access requires international connectivity, the two issues are one and the same. This was borne out by the results of a 2002 survey for UNESCO on *Internet Infrastructure and eGovernance in Pacific Islands Countries*.⁹² The survey of 15 countries found that the cost of international telecommunications was the most frequently identified constraint (12) followed by the cost of equipment (9), the cost of domestic telecom services (8) and telecom bandwidth (7). Next in order were lack of technical support (4), a reliable power supply (3), access to a telecom network (2), staff appreciation of the Internet (2) and organizational structure (1). Access to a telecom network was not seen as a major problem, but it should be noted the respondents were Government officials who are most likely to have access and whether they were answering on behalf of Government or as representatives of the general public is not clear. Lack of bandwidth is an issue of infrastructure investment, but this may be as much if not more of an issue about the cost of international capacity than about the local network. (See Okamura and Durand, 1996.⁹³) However it is worth noting that French Polynesia is the only Pacific Island to install ADSL broadband to date.

Third, 'the introduction of pre-paid cellular has led to an explosion of growth in mobile customers in some countries and in Fiji mobile subscribers exceed fixed line subscribers in 2002.' (Pacific Islands Forum Secretariat, 2003, p.3.⁹⁴) Evidently the trends in the rest of the EAP region towards mobile cellular phone substitution for fixed lines are beginning to make themselves apparent in the Pacific Islands. By-mid 2003 nine digital systems had been deployed,⁹⁵ including Kiribati, Samoa, Solomon Islands, the Marshall Islands and the Cook Islands, the rest analogue. By the end of 2003, New Caledonia even had a 3G network. Cellular is not appropriate for surfing the Web, but it does provide a much more affordable means of basic access. Fourth, new wireless technologies are on the horizon such as broadband wireless known as WiMax that has a directional reach of up to 50 kilometres. On its own this technology may not be the answer to the problem of serving outlying islands, but as a broadband solution for urban centres it holds a lot of promise. Typically PICs use HF radio to link their outer islands, while some are shifting

⁹² <http://pacificforum.com/it1/cgi-bin/jump.cgi?ID=66>

⁹³ It is reported that the University of South Pacific (USP) at Suva, Fiji was paying around US\$60,000 annually for a 4.8Kbps link to Australia in the mid-1990s. The University of Guam was better off, paying US\$48,000 for a 64 Kbps link to the University of Hawaii. N.Okamura and E. Durand (1996) 'The Pacific Islands Telecommunications and Information Infrastructure: Leap-frog or Widening Gap?' PTC Proceedings, pp.934-947. <http://www.peacesat.hawaii.edu/40RESOURCES/Library/Papers/Leapfrog.htm>

⁹⁴ When GSM replaced analogue in the Cook Islands post-paid subscribers rose from 790 to 850, and pre-paid from 650 to 1,200. See <http://www.pacificislands.cc/pm42004/pmdefault.php?urlarticleid=0043>

⁹⁵ Global Information Inc. (12/2003) http://www.gii.co.jp/english/pa17084_south_pacific_telecom.html

to satellite links as costs fall, and some are deploying microwave links, as in Fiji, the FSM (Federated States of Melanesia) and between Samoa and American Samoa.

Infrastructure expenditures need to be financed somehow, and it may well be that over time broadband wireless connections can stimulate the take-up of Internet and Web-based services, but this presupposes telecom as a stimulant to economic growth and development.

Telecommunications and Development

If we look for correlation between teledensities and aspects of the Pacific Island countries the only evident one is with per capita GDP. From Table CS3.1 the correlation coefficient for fixed is $r = 0.56$, but for mobile, $r = 0.95$. These findings are consistent with the idea that while mobile cellular is in demand by anyone who can afford it, fixed line access has been driven much more from the supply-side, providing access to Government while families and friends make do through sharing access. When the economic structure of the countries listed in Table CS3.1 is examined it becomes apparent that countries with higher fixed line teledensities all have at least some notable element of tertiary sector development, tourism or Government or both. Those with low teledensities are all dependent upon primary activities such as fishing, mineral extraction and agriculture.

This finding matches countries with higher and lower per capita GDPs as would be expected, and raises a point about what the Pacific Islands do or do not have in common. Identifying common features, if there are any, is important in the development of regional strategies, and the most important objective should be to reduce the cost of international bandwidth. A reduction in bandwidth costs would complement the lowering of the domestic price ceiling due to competition from mobile. Okamura and Durand (1996) make the point that it is useful 'to differentiate the Pacific countries according to their relative ability to build a potentially viable economy at current or reduced levels of aid.' (p.3). This point meshes very well with the 'virtuous loop' concept in Part 2 of the Note. If telecom and ICT policy can be focused on strengthening the strong points of the Island economies, and separated from policies designed to cope with poverty which may or may not also involve ICTs and telecom infrastructure, then a virtuous loop can be made to work itself throughout the society. Initial indicators of the loop effect at work will be the take-up rate of pre-paid mobile cellular phones and the extent to which technologies like WiFi and local multimedia content can excite local interest. The major constraint on the working of the loop will be the price of international bandwidth. Unless this falls, Internet access and Web-based content will remain out of reach of the great majority of people.

If a virtuous loop can be realized, the issue of tariff rebalancing will be lessened if not overcome entirely. Callback and technologies such as Internet Telephony will eat away at international calling prices, but not at Internet dial-up prices paid by consumers or international bandwidth prices paid by the operators. This problem has already arisen in Fiji.

The Case of Fiji

Fiji's telecom model went from a Ministry model to a corporate PTA model, together with a 25-year exclusive franchise, and then to privatization model in the space of ten years. Telecom Fiji was separated from posts in 1996 and in 1998 the Government created Amalgamated Telecom Holdings (ATH) to take over Telecom Fiji (domestic services) and to manage FINTEL (international services) in which the Government holds a 51 per cent stake in a joint venture with Cable & Wireless. ATH, which listed on the local stock exchange in 2002, was paid F\$253 million by the Fiji National Pension Fund (FNPF) for the acquisition of 49 per cent share, later raised to 51 per cent, which some business commentators at the time considered excessive by around F\$100-150 million.⁹⁶ Employers and employees make compulsory contributions to the F\$2.2 billion FNPF that has become the major source of Government local borrowing. Telecom Fiji then created a mobile cellular subsidiary and became majority shareholder in a joint venture with Vodafone. Since 2000 ATH has returned profits of around US\$40 million.

Currently the Government is reviewing the 25-year exclusive franchise in preparation for a new Telecommunications Bill and may introduce either facilities or services competition. The regulator has been quoted as saying that free competition is unlikely until 'an appropriate level of national development' has been reached, which seems to imply not until the rural areas are being served. This reflects the incumbent's view who argues that if facilities competition is introduced licences should require new entrants to become full service providers, including the universal service obligation, and an interconnection arrangement should include an Access Deficit Charge to fully compensate Telecom Fiji for providing network services to uneconomic areas. The involvement of the Pension Fund makes it likely the Government will act very cautiously. That is the political economy reality.

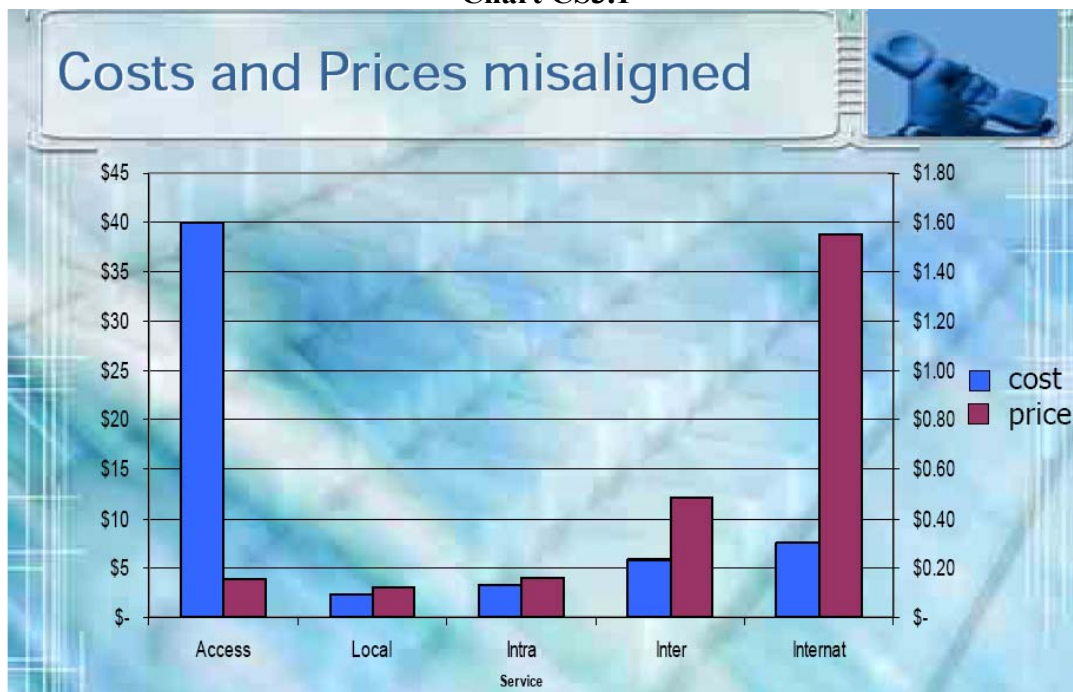
The economic issue arose directly in 2002-03 when TELPAC Ltd, an US-owned company, was granted a Foreign Investors Certificate to open an Internet Kiosk and call centre. TELPAC began offering international voice callback services using a switch in the USA, cutting prices by up to 44 per cent. The *Pacific Magazine and Island Business* report cites one estimate of callback as 15 per cent of international traffic and FINTEL's lost revenues as F\$6 million. The company claimed to have customer accounts from businesses and even Government departments in Fiji. In November 2003 a Cabinet meeting declared callback illegal, issuing a new regulation to that effect, a decision subsequently upheld by the Fiji High Court.⁹⁷ One of the points raised in the public debate by TELPAC was that international submarine leased circuit prices have fallen dramatically since 2000, and since Fiji is connected to the Southern Cross system (Guam is the only other Pacific Island connected to a cable network) its international prices should fall correspondingly. ATH has responded that price reductions have been introduced, with selective discounts on IDD and NLD of up to 44 per cent and 50 per cent, and a fall in the price of Internet access of over 50 per cent, but the cross-subsidy model is still in place. A major subsidy is currently going to a broadband-satellite access

⁹⁶ 'Fiji Telecom Row's Heading to Court', *Pacific Magazine and Islands Business*, January 2003.

⁹⁷ An identical argument has been going on in Palau where a would-be start-up, Palau BroadBand wants to offer cheap Internet calling and is being opposed by the Palau National Communications Corporation.

project for rural areas.⁹⁸ In 2003 one-third of capex was committed to this project that involves building an earth station and providing Vsat dishes together with power generators to all Fijian villages to provide voice, data and Internet access up to 128 Kbps.⁹⁹ According to the Ministry of Communications, which has approved an investment allowance to cover the ICT aspect of the project, in 2003 over 600 villages were still without access to telecom.¹⁰⁰ The entire project is scheduled to cost US\$45 million over 10 years. To make sense of the economics, ATH is arguing for a tariff rebalancing programme phased in over three-years. ATH has a clear understanding that mobile roaming, Internet calling, emails, free-call numbers, callback and calling cards are and will continue to erode international revenues. Chart CS3.1 comes from Telecom Fiji and illustrates the current imbalances between costs and prices.

Chart CS3.1



The case of Fiji brings out the basic economic dilemma for a telecom utility in a small island economy, but also points to solutions. Fiji is well placed as a service economy to develop, in addition to tourism, call centres, business process outsourcing, data warehousing and other low-medium end IT business services. It has the advantage of being in Australasian time zone (and therefore hours ahead of the USA) and connected to the Southern Cross cable system. This means it can take full advantage of the falling costs of international bandwidth. Subject to the critical question of political stability,¹⁰¹ it

⁹⁸ Some islands are up to 70 kilometres by sea, too far for terrestrial microwave.

⁹⁹ <http://www.bulafiji.com/doc/pdf/telecom%20issues-pdf>

¹⁰⁰ <http://www.pacificforum.com/ict/wsis/conferencereport.doc>

¹⁰¹ Two coups in recent years reflect the inherited conflict between traditional land ownership rights of the Fijian tribal chiefs and the Island's modernizing commercial interests in which the Indian community, close to 50 per cent of Fiji's population and mostly urban, play a lead role. Contrary to popular media reports, the root of the conflict does not seem to be ethnic as such, which is hopeful for the future of Fiji.

is a perfect candidate for opening its telecom markets to a greater degree of competition to drive demand elasticity and promote itself as a centre of economic and social development. In this way Fiji may become a model for Pacific Islands with a potential for self-development.

Papua New Guinea

Pacific Island countries are looking for models. Papua New Guinea is privatizing its state monopoly, although a recent change of Government derailed the original tender that was to have given a consortium led by ATH of Fiji and the Steamship Trading Company Ltd. (PNG) a stake of 51 per cent in PNG Telikom. The new Government had claimed the bid seriously undervalued Telikom and according to press reports Econet of South Africa is now the front runner after Korea Telecom pulled out of the bidding citing 'PNG's risk'.¹⁰² Whoever wins will enjoy a monopoly over fixed and mobile networks. PNG has been struggling to improve its institutional capacity in recent years with the passing of the Telecommunications Industry Act 2002, the Community Services Trust Act 2002, the Rural Development Authority Act 2002 and the Independent Consumer and Competition Commission Act 2002. This last Act establishes a new economy wide regulator who is responsible for licensing as well as pricing and consumer protection issues. PANGTEL, the telecom regulator, will focus on standards, spectrum management and numbering. The Community Services Trust will donate land for providing telecom facilities with local communities contributing up to 20 per cent and provide matching funds up to 40 per cent where need is demonstrated. These measures are designed to lift village access levels,¹⁰³ however a lack of funds has so far resulted in zero results.¹⁰⁴ Despite this practical difficulty PNG after many years of internal conflict¹⁰⁵ has began to shift from the PTA model to a model of public-private participation. A change of Government¹⁰⁶ has not reversed this process and institutional reforms have been legislated to optimize the use of scarce human resources and technical knowledge. This is a start in the right direction if the process can be conducted professionally.

Timor Leste

Comparable to Cambodia's experience, the war in Timor Leste ended with the horrors of a scorched earth policy that destroyed most of its meager telecom infrastructure. All that was left was a telephone exchange with 6,000 lines in the capital Dili to which Telstra (Australia) added 2,000 lines and a Vsat system for UN peace-keeping troops and one Internet café. In 2002 in an auction process that attracted only one other bidder, a 15-year concession was awarded to a consortium led by Portugal Teleom who hold 50.1 per cent of the new company, Timor Telecom. The Government of Timor Leste have a 16.5 per

¹⁰² 'South African Firm Tipped to Win Telikom Bid: PNG/Fiji joint venture dumped' Pacific Magazine and Islands Business – <http://www.pacificislands.cc>. Econet has won telecom licenses in Zimbabwe and Kenya and is headed by Strive Masiyiwa, part of an emerging cohort of African entrepreneurs in this sector.

¹⁰³ See <http://www.pacificforum.com/ict/conferencereport.doc>

¹⁰⁴ PNG's Public Accounts Committee 'found that the Community Service Trust Act... was not functional because it had no funding.' PNG Post Courier, 12 November 2003.

¹⁰⁵ In 2002 PNG voted to grant autonomy to the island of Bougainville with a referendum on independence in 10-15 years, a move that brought to a close a period of sporadic violent conflict.

¹⁰⁶ The new Government of Prime Minister Puka Temu opposed the previous regime's wholesale privatization scheme adopted under some pressure from IFIs that led to 'IMF riots' in the late 1990s.

cent share, a consortium of local companies hold a further 16.5 per cent, Vodatel of Macau holds 10.9 per cent and the remaining 6 per cent had yet to be allocated. The concession runs for 15 years and gives Timor Telecom exclusive rights to provide international and domestic telecommunications, fixed and mobile. An ISP licence was also offered for auction but in the absence of any other expressions of interest, this too was awarded to Timor Telecom. Telstra continues to operate the original Internet link from Dili.

The use of the concession method compares with another ex-Portuguese colony, Macau (Macau returned to Chinese sovereignty in 1999). A 20-year exclusive concession, a BOT, was awarded in 1981 to a consortium of Cable & Wireless (UK) with 51 per cent,¹⁰⁷ Portugal Telecom with 28 per cent, CITIC, a Chinese state overseas investment company with 20 per cent, and the Macau Government with 1 per cent. The concession was later extended a further 10 years, but without exclusivity over mobile cellular or valued-added services such as Internet service provision. In the case of Macau the advantage of the concession method was seen to be twofold. It would guarantee investment from an experienced international carrier and the state would retain ultimate ownership of assets at a time when a return of sovereignty to China was under consideration. The same arrangements in Timor Leste for a 15-year period with Portugal Telecom clearly leverage historic ties with Portugal and make an interesting contrast with the model adopted by Cambodia where markets, especially mobile cellular, were opened to competitors. Like Timor Leste, Cambodia had a UN peacekeeping mission stationed on its territory, and received not a little aid and attention from international donors. Cambodia also had Thailand as a neighbour where entrepreneurs were interested to invest in the region. Immediately after Independence Timor Leste's relations with its neighbour, Indonesia, were more akin to Cambodia's earlier relationship with Vietnam, and in Timor Leste the operating environment is perhaps even more challenging than Cambodia's.

Timor Leste's population is small, somewhere between 800,000 – 1 million, but young. The median age is 20 years.¹⁰⁸ The terrain is rugged and forested, with elevations up to 3,000 metres making communications difficult. The country is 15,007 square kilometres, so average population density is around 67 persons per square kilometre. Portugal Telecom, who gave an interview for this study, is committed under the Concession to providing fixed line services to all fourteen regional capital towns and has been given a universal service obligation for the regional capitals. Currently there are 2,000 fixed line subscribers and 20,000 mobile subscribers, a ratio very similar to Cambodia. Timor Telecom has installed mobile switching centres in Dili and three other regional capitals, and connects four others by Vsat.

Portugal Telecom seems resigned to the prospect of the long-run rate of return being no more than 10 per cent compared with between twice and four times that for some mobile

¹⁰⁷ Cable & Wireless was already operating Hong Kong's international network and later took control of Hong Kong Telephone Company's domestic network.

¹⁰⁸ Estimates of those killed during the twenty-five years of conflict with Indonesia vary from 100,000 – 250,000. Refugees numbered 260,000 who fled the country, but most have now returned with help from the UN. CIA (2004) World Factbook, <http://www.cia.gov/cia/publications/factbook/geos/tt.html#Intro>

cellular operations elsewhere in the world.¹⁰⁹ The first tranche of investment is around US\$25 million, and the second is due to be raised from bank lending, including local banks, and retained earnings, and this will be a challenge. Advances in wireless technology may help over the next few years, for example a third generation mobile network could cut down operating costs, and WiMax could bring broadband services to rural areas, but the real problem is affordable prices and effective demand. Purchasing power parity-measured per capita annual income was estimated at US\$500 in 2001. A monthly post-paid fixed line connection costs US\$14.50 or one-third of per capita income. A post-paid mobile phone subscription is US\$10 per month. Per minute international calls are just less than 50 US cents for both fixed and mobile. At these prices, pre-paid mobile is the only answer for most people who need to own a telephone, and with unemployment and under-employment estimated anywhere between 20-50 per cent, incomes for the vast majority of people are very low. But in many developing countries Portugal Telecom is familiar with, for example Angola and Brazil, a pre-paid phone is also a means to find employment because of contactability. In Angola the highest arpu's (average revenue per user) are found outside the urban areas and in Brazil in the poorest neighbourhoods. Pre-paid also provides anonymity which can be used for unlawful activities.¹¹⁰

Timor Leste's economy is 25 per cent agriculture, 17 per cent industry, including printing, soap manufacturing, handicrafts, woven cloth and textiles, and the remainder services. The country exports coffee, sandalwood, marble, vanilla and with a potential for oil although a territorial dispute with Australia over oil reserves is hindering progress. As the CIA World Factbook points out, this leaves Timor Leste with a funding problem.

Growth was held back in 2003 by extensive drought and the gradual winding down of the international presence. The country faces great challenges in continuing the rebuilding of infrastructure, strengthening the infant civil administration, and generating jobs for young people entering the workforce. One promising long-term project is the planned development of oil and gas resources in nearby waters, but the government faces a substantial financing gap over the next several years before these revenues start flowing into state coffers.

None of the country's main economic activities and exports would seem to be particularly dependent upon telecom, which is just as well given the high international tariffs involved. On the other hand, the country does have an urgent need to improve its domestic communications as part of the nation-building process and to strengthen the roots of democracy and civil society. Whether the concession method with exclusivity was the best way to go is questionable. Exclusivity could have been granted within a more flexible licensing framework which could be linked to returns on capital, but the priority is clearly to focus upon funding the essential infrastructure, and there is currently little evidence that significant private capital is available or willing to enter. The most

¹⁰⁹ Due to Timor Leste's 'special relationship' with Portugal, plans to provide telecom services are regarded 'almost as a social benefit.' (Interview).

¹¹⁰ In another twist to the story, in Angola the demand for mobile phones outstrips supply and some police will accept bribes to allow people to jump the queue outside shops selling mobile phones.

hopeful sign is that Portugal Telecom and PT Telkom of Indonesia are discussing ways to improve communications between the two countries. If relations between the two countries can find a new beginning the prospects for Timor Leste could improve dramatically. Trade and investment between Indonesia and Timor Leste would benefit both countries, and create communities of interest for telecom traffic. Therefore this is a model in which the virtuous loop of technology-regulation-markets may require external incentives to get started.

Telecom Models – Evolving or Not?

As table CS3.1 demonstrates, the monopoly model is the norm across the PICs and in recent times incumbents have been pressing for extensions of their exclusivity. Only Tonga has competition in both fixed and mobile cellular, and American Samoa and Guam in mobile cellular. With one or two exceptions, such as the Republic of Nauru where telecom remains within the Ministry, departments of Government have been turned into statutory SOTE corporations, and in some cases the model also opened up to invite private participation on a concession basis. Cable & Wireless pioneered this model in the southern Pacific from the late 1970s in Cook Islands, Fiji, Solomon Islands, Tonga and Vanuatu. In Fiji, under concessions in Fiji, Cable & Wireless now operates the international service, Fintel and Vodafone operates the mobile cellular network. Both concessions run until 2014. In 2003 the expiring 15-year concession in the Solomon Islands was extended a further 15 years. Telecom New Zealand has replaced C&W to own 60 per cent of Telecom Cook Islands in joint partnership with the Government under an exclusive 10-year concession granted in 1997. In Samoa, Telecom New Zealand owns 90 per cent of Telecom Samoa Cellular with the Government holding 10 per cent where in theory it competes with Government-owned fixed line operator SamoaTel.¹¹¹ France Radio and Cable (France Telecom) jointly own Telecom Vanuatu through to 2012 with Cable & Wireless and the Government (one-third each) and also run the networks in New Caledonia, French Polynesia (Tahiti) and Wallis & Futuna. In Kiribati, Telstra (Australia) is the joint-venture partner with the Government in Telecom Services Kiribati Ltd (TSKL) offering fixed and cellular services while the assets are owned by Government-controlled Telecom Kiribati Ltd.

In American Samoa, a private company, Blue Sky, competes in mobile with the America Samoa TeleCommunications Authority (ASTCA). The only island country to have competition in both fixed and mobile is Tonga where the Tonga Communications Corporation and Shoreline Communications form a duopoly. Shoreline is a conglomerate that has interests in Tonga ranging from power and oil to aviation, property, and distribution and has close connections to Tonga's royal family. The King's eldest son, Prince Tupouto'a, is a director of the company which is registered in New Zealand, and also chairman of TonFon that Shoreline uses to offer international calling cards. TonFon has aspirations to become a Pacific Islands-wide international calling card company and has been negotiating with Blue Sky to extend its service to Samoa.

¹¹¹ However 'SamoaTel claimed not to have access to adequate financing for infrastructure expansion, which limited the development of a proper interconnection infrastructure. As a consequence, the lack of adequate interconnection facilities in SamoaTel has been used by TSC as an excuse for not expanding its own network.' Project Appraisal Document, The World Bank, Report No. 24794, 20 November 2002, p.6.

In the northern Pacific, the model of the Marshall Islands National Telecommunications Authority (MINTA) is an interesting variant. Government owns 25 per cent of the shares of the privatized corporation. Citizens of the Marshall Islands own the rest, but each is limited to a maximum of 3 per cent of individual shareholding. In the Northern Mariana Islands, Micronesian Telecommunications Corporation (MTC) was privately owned by Verizon (USA), but in May 2004 the regulator, the Commonwealth Telecommunications Commission, following FCC approval, gave permission for the sale to Pacific Telecom controlled by Citadel Holdings, Inc. (Philippines) the investment company of the Delgado family.¹¹² This is the first time FDI from the Philippines has been involved in overseas telecom investment. The Islands' Governor had opposed non-US interests taking control and the Government of the Philippines had lobbied the US Trade Department and FCC for reciprocity in trade and investment policy. Among the issues under negotiation were inter-island tariffs, a tariff freeze, a commitment to existing staffing levels and whether other telecom companies would have the right to buy capacity on the optical fibre submarine cable that connects the Northern Mariana Islands to Guam and to the north Pacific cable system. In Guam, part of US territory and an important US navy base, the Government is trying for the second time to attract private bidders for the fixed-line monopoly state-owned corporation, Guamtel. Fixed line revenues have been falling as people switch to mobile, a market in which Guamtel has been losing ground to four competing mobile networks. The 'most significant' reason 'has been GTA's lack of market presence due to policy expectations that GTA will not compete against private sector firms.' (Annual Report, 2003). The cost of this restriction to Guamtel can be seen from the fact that while mobile cellular revenues constitute 20 per cent of Guamtel's total revenues, mobile costs constitute only 6 per cent of total costs.

In countries where growth opportunities are highly restricted, and where telecom would seem to offer little in the way of economic development, a restricted model probably fits best into an Island's system of farming its scarce resources, but only if it is accompanied by an accountability and responsibility system. This is perhaps an area where multilateral assistance is most appropriate in these cases. In other cases the argument for liberalization of services, if not in the first instance facilities, would seem logical. This is the position of the Pacific Islands Forum Secretariat (2003), although it states far too emphatically the case for services rather than facilities competition, no doubt reflecting the arguments of the incumbents who may be under pressure to open the door to competition, but not by too much. The danger with this position is that service providers will find themselves at the mercy of the facilities owners and priced out to the margins of the market. This would short-circuit the workings of the virtuous loop and it is unlikely that regulators would be able to protect them. Since the role of regulation (positive feedback) is also part of the loop, progress would be minimal. A better starting point therefore would be at least to keep open the option of facilities competition for future consideration depending upon how successfully a virtuous loop became evident.

Interviews conducted by email with representatives of operators in the Cook Islands and Fiji, who are also active in the Pacific Islands Telecommunications Association (PITA),

¹¹² The Delgado family also owned Islacom in the Philippines before its sale to Globe Telecom.

confirmed there were different views as to whether competition in some of the larger islands was economically feasible. Tonga has a population of just over 100,000 and has competition. Island nations with larger populations are the Federated States of Micronesia, French Polynesia, Guam, New Caledonia, PNG, Samoa, Solomon Islands and Vanuatu, but some of these territories consist of many islands and atolls spread over hundreds of square kilometres of ocean. For example, in the FSM many of the islands are mountainous and covered in dense forests, in French Polynesia 118 islands and atolls are spread over 500 square kilometres of ocean, and the Solomon Islands are spread over 900 square kilometres of ocean. Generally the view of PITA is that competition in services is possible, for example in Internet services, but facilities competition is not economically sustainable.¹¹³ The question this raises is whether competition in mobile networks is feasible, and therefore is network competition between mobile and fixed feasible. In some cases mobile subscribers have already exceeded fixed line subscribers in Fiji, French Polynesia and Caledonia for example, and in 'some PICs pre-paid cellular accounts for 80-90 per cent of the cellular market.' (Fiji interview.)

Before the FCC of the USA imposed its benchmark accounting and settlement rates,¹¹⁴ international tariffs were a major source of cross-subsidy for domestic telecom tariffs and investment, but now these are being squeezed. This would not be a problem if the price elasticity of demand were high, but in the case of the Cook Islands it seems that a 20 per cent tariff reduction only brings an increase in traffic of around 5 per cent.¹¹⁵ There is the added problem that a decline in international revenues by reducing profits may also reduce the purchasing power within the islands and that in turn reduces international traffic. But these responses to price reductions are for voice calls, while Internet access and usage remains quite low. The issue therefore seems to be one of income elasticity, not so much one of price elasticity. For Island nations with growth potential, the diffusion and adoption of the Internet is one factor that can contribute to trade and investment opportunities. The case for service competition in the provision of Internet seems overwhelming, but two issues arise. First, monopoly carriers are for the most part offering bandwidths of no more than 1.5 Mbps that must be shared, and are reluctant to invest more heavily, and second, they are suspicious of the possibilities of by-pass. Breaking out of this vicious circle into a virtuous loop will require some kind of government commitment to the sustainability of development. Granting exclusive franchises may protect investment, but it is unlikely to stimulate it.

ICTs and Social and Economic Development

To date most of the discussion within the Pacific Islands has been more focused on the social and political implications of improved communications. These involve issues such as keeping family members in touch when some of them travel from outer islands to the

¹¹³ It should be noted that the costs of building a domestic network are essentially the same as anywhere else, except for two factors. First, transportation costs and import duties may raise the price of equipment. Second, providing inter-island connectivity may require satellite communications. Subject to these cost barriers, the issue of competitive entry is essentially one of market size.

¹¹⁴ Where teledensity is below one and for low-income countries below \$726 per year, the benchmark is 23¢ per minute; for lower and upper middle income countries (\$726-8,955) it is 19¢; for higher income countries it is 15¢.

¹¹⁵ Interview with Telecom Cook Islands

capital city, and in keeping people in remote areas informed about emergencies, like coming cyclones and tsunamis, and informed about government announcements and policies. Another set of serious issues arise from people abandoning rural areas and migrating to the capital city, causing real economic and social problems in some Island nations. Communications is seen as a way to bring economic activity to outer islands to stem the flow of migration. So once again a connection is being made between telecom and economic as well as social development. In some cases social problems spill over into ethnic tensions between islanders, as has happened in the Solomon Islands. Box CS3.1 gives an example where telecommunications can help.

Box CS3.1: People's First Net

The Solomon Islands consists of around 850 islands covering 27,000 sq. kms of land and 900 sq. kms of ocean. Communications between the islands is difficult at the best of times, relying upon impersonal short-wave radio or expensive satellite communications, but they have become an ever more urgent issue in light of recent conflicts between groups from Malaita and Guadalcanal that have torn the Solomon Islands apart. In 2001 an initiative was begun called People's First Net (PFN) with support from the UNDP. Email stations were set up in schools and rural clinics run by committees of village chiefs and religious leaders.

The email stations consist of aging laptop computers, a radio and modem, powered by a car battery that runs off solar power. The kit costs around US\$8,000. Emails are sent several times a day by satellite to an Internet café in Honijara that acts as a hub offering speeds of up to 2 Kbps, so emails take about 10 seconds to transmit. According to a report on BBC News Online, 6 April 2004, about 700 messages were sent and around 900 received during February, about 20 per cent of them going overseas. PFNet is also supported by a system developed by MIT called the Tek project that receives search requests, undertakes them using broadband capacity in the US and then transmits the Web information back to the Solomon Islands.

Ref: <http://www.ejds.org/meeting2003/ict/papers/learning.pdf>

Public Service Networks by Satellite

As satellite organizations are essentially commercial in nature few offer services directed towards vast stretches of ocean except for Inmarsat that provides commercial services to shipping. For commercial terrestrial communications the only choices are Intelsat that provides three C-band satellites over the Pacific Ocean and one Ku-band satellite covering the South Pacific, and PanamSat 2 that covers part of the western Pacific. The University of Hawaii began offering a non-commercial satellite service named PeaceSat¹¹⁶ in the late 1980s using an old meteorological satellite. PeaceSat arose from the efforts of the Fisheries Forum Agency (FFA) to conduct a surveillance and enforcement programme to protect fisheries, using PeaceSat for terrestrial

¹¹⁶ At <http://www.peacesat.hawaii.edu> Pan-Pacific Education and Communication Experiments by Satellite (PeaceSat) uses a retired NASA ATS-1 satellite and mainly provides education, health and medical emergency services and technology transfer services.

communications and Inmarsat for marine communications, a good example of public-private sector and regional cooperation.¹¹⁷ Japan's Tohoku University joined the PeaceSat programme using the ETS-V (Engineering Test Satellite-V) to launch PARTNERS (Pan-Pacific Regional Telecommunication Network Experiments and Research by Satellite) and has followed up with Post-PARTNERS that now involves Japan, Hawaii, Fiji, Indonesia, Thailand plus Malaysia and the Philippines. The programme experiments with satellite radio signal propagation and with testing the effectiveness of multi-lingual distance education and distance medical services in remote areas.¹¹⁸ Another public service network is USPNet was established in 2000 to connect the University of the South Pacific via 64 Kbps links to centres in the Cook Islands, Fiji, Kiribati, the Marshall Islands, Nauru, Samoa, Tokelau, Tonga, Tuvalu and Vanuatu. There are also four 128 Kbps channels for video-conferencing.

The role of regional organizations has been important in promoting the development of telecommunications and an information infrastructure in the Pacific Islands. For example, SOPAC (South Pacific Applied Geoscience Commission) offers assistance to Pacific Island countries 'in gathering and sharing affordable information and communication technologies as they apply to fresh water, access to energy, hazard assessment and disaster management.'¹¹⁹ The Pacific Forum Secretariat has been promoting the importance of regulatory issues to ensure affordability as well as availability of access and services.

The Internet and Domain Names

Affordability and accessibility is the key issue for making the Internet more widely available and encouraging its usage. The first Internet service in the Pacific Islands was launched in 1996 in Fiji by Telecom Fiji, FINTEL, Telecom New Zealand and the University of the South Pacific under the auspices of the Telecommunications Program of the South Pacific Forum. 'Within a few months of operation the trial had 143 modem users while traffic reached over 900 Mbps per month - piquing the interest of other Pacific Island telecommunication service providers studying the feasibility of offering their own Internet access service.'¹²⁰ Today every Pacific Island country is connected to the Internet by satellite or in rare cases by cable, but the smaller outer islands have no such connections due to equipment costs and power supply problems.

Approximately 25 per cent of Pacific islanders have regular access to the Internet. The number of Internet subscribers ranges from about 1 in 5 in Niue (where access is free) to 1 in 1,000 in Solomon Islands. Users in only three Pacific countries (Papua New Guinea, Samoa and Tonga) have a choice of Internet Service Providers; while users in all other countries are served by monopoly ISPs. (PECC, 2003, *ICTs For Every Pacific Islander: Potential, Constraints and Opportunities*.)

¹¹⁷ <http://www.unescap.org/tid/projects/pacific2.asp>

¹¹⁸ See <http://www.sspi.org/orbiter/Aug-Sept03/views1.html>

¹¹⁹ *Information and Communication Technology for Development in the Pacific*, Asian Development Bank, 2003 which contains a useful up-to-date reference list of regional organizations.

¹²⁰ Michael Ogden "Islands on the Internet" Pacific Telecommunications Review, 4th Quarter 1999 pp.5-15

The reference here to ‘free access’ to the Internet in Niue is explained in Box CS3.2 and is connected with the lucrative island business of Internet domain names. The domain name of Tuvalu is .tv, which is in great demand and from its sale Tuvalu makes around US\$2 million a year (US\$100 per inhabitant). Samoa’s domain name is .ws which can mean Wall Street or Web site, and Kiribati’s .ki can mean energy in Chinese, and so on. Even Pitcairn’s .pn generates around US\$100,000 per year, or US\$2,000 per inhabitant.

Box CS3.2: Internet Users Society of Niue

The domain name of Niue is .nu and was bought by .NU Domain Ltd, owned by a US technology entrepreneur Bill Semich giving him the right to use and to sell the .nu Internet namespace. According to the National Business Review (23 January 2004) by late 2003 there were over 100,000 .nu domains each generating US\$30 per year. Bill Semich also set up a charitable IUSN (Internet Users Society of Niue) venture to provide computers and Internet connections to schools. In 1997 he took over an Intranet in Niue built by a former Peace Corp volunteer and technical director of IUSN, Richard St Clair and brought the first email connection to an Internet café in Alofi, Niue’s capital.

In 2003 IUSN began offering island-wide free access to a WiFi network to encourage usage by Government, businesses, tourists and local residents. This flew in the face of the Government’s 2002 draft ‘National Policy on Telecommunication for Niue’. In this document, which has never been passed the draft stage, Telecom Niue states ‘introducing competition in any aspect of the business may not be timely, as any threat to the viability of Telecom Niue would threaten the basic infrastructure that we have been building over the past few years.’ IUSN’s copper wire connection to the Internet was for a time cut-off. IUSN has reconnected and is apparently paying Telecom Niue ten times the price an Internet connection would cost in New Zealand¹²¹ and continues to offer free WiFi access.

Telecom Niue wants to protect its monopoly, and especially its high overseas tariffs. For example, a call to New Zealand where most overseas Niueans live, is US\$1.60 per minute. ‘Although it does not make revenues public, a 2002 government policy document notes that Telecom Niue’s returns above cost are routinely creamed by the government, even though they are theoretically set aside for capital expenditure and other network related expenses.’ (National Business Review, 23 January 2004). In this case the use of telecom revenues to support the Government’s budget stands in opposition to any benefit that could come to Telecom Niue from stimulating sufficient local interest and usage of the Internet to induce spillover effects.

¹²¹ ‘IUSN paid Telecom Niue \$10,000 a month for a 64K frame relay connection to the New Zealand Internet backbone in 2003, a connection it said would cost \$20 inside New Zealand.’ National Business Review, 23 January 2004.

Conclusions

- Finding a way out of the vicious circle of isolation and loss of population and resources due to migration is no easy task for the Pacific Islands. There are PICs with growth potential, especially those island economies that can generate jobs and develop trade-in-services, such as tourism, supported by ICTs. ICTs require affordable and available access to telecommunications, but the lack of economies of scale is a severe hindrance to investment and the sustainable development of the infrastructure. Most PICs have adopted and cling to a monopoly model, although there seems to be a growing realization that competition, at least in services, can be a spur to growth in demand and usage. This almost certainly applies to mobile cellular services as well, especially pre-paid.
- While there may be a strong economic case for a monopoly fixed line facilities provider, the speed at which technologies develop and rapid changes in factor prices can outdate this model very quickly. It therefore makes better sense to build in flexibility to policy and regulation by replacing exclusive long-term concessions with licensing regimes that are linked to output and performance. Where an incumbent is committed to investment and system upgrades, such as investment in broadband, the licensing policy can be restrictive to offer periods of protection. Monopoly rents can then be used to cross-subsidize network expansion to outer islands. But this policy requires reforms to regulation, including more rigorous and transparent accounting procedures so the exact nature of costs and revenues can be tracked.
- The only economically viable basis for shifting from a *de facto* monopoly situation to a more open and competitive model is if ICT adoption and diffusion is likely to stimulate economic activities within a Pacific Island country. To maximize the chances of success, governments need to coordinate ICT strategies between the relevant ministries. This is where small size can play to the advantage of the Islands. It is important that initiatives are undertaken because that is the only way to test the possibilities, so policy and regulation need to become sufficiently flexible to open the door to opportunities. Finally, regional initiatives will always be important for sharing resources and allowing the better off Pacific Island countries and donors to help the most needy. The economic ties between Pacific Islands vary enormously, and in many cases are non-existent, so searching for a common solution to poverty and development is unlikely to yield results, but there would seem to be a case for promoting some regional initiatives, such as a regional satellite programme that could offer shared capacity. This will require close collaboration between the public and private sectors and donors.